AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

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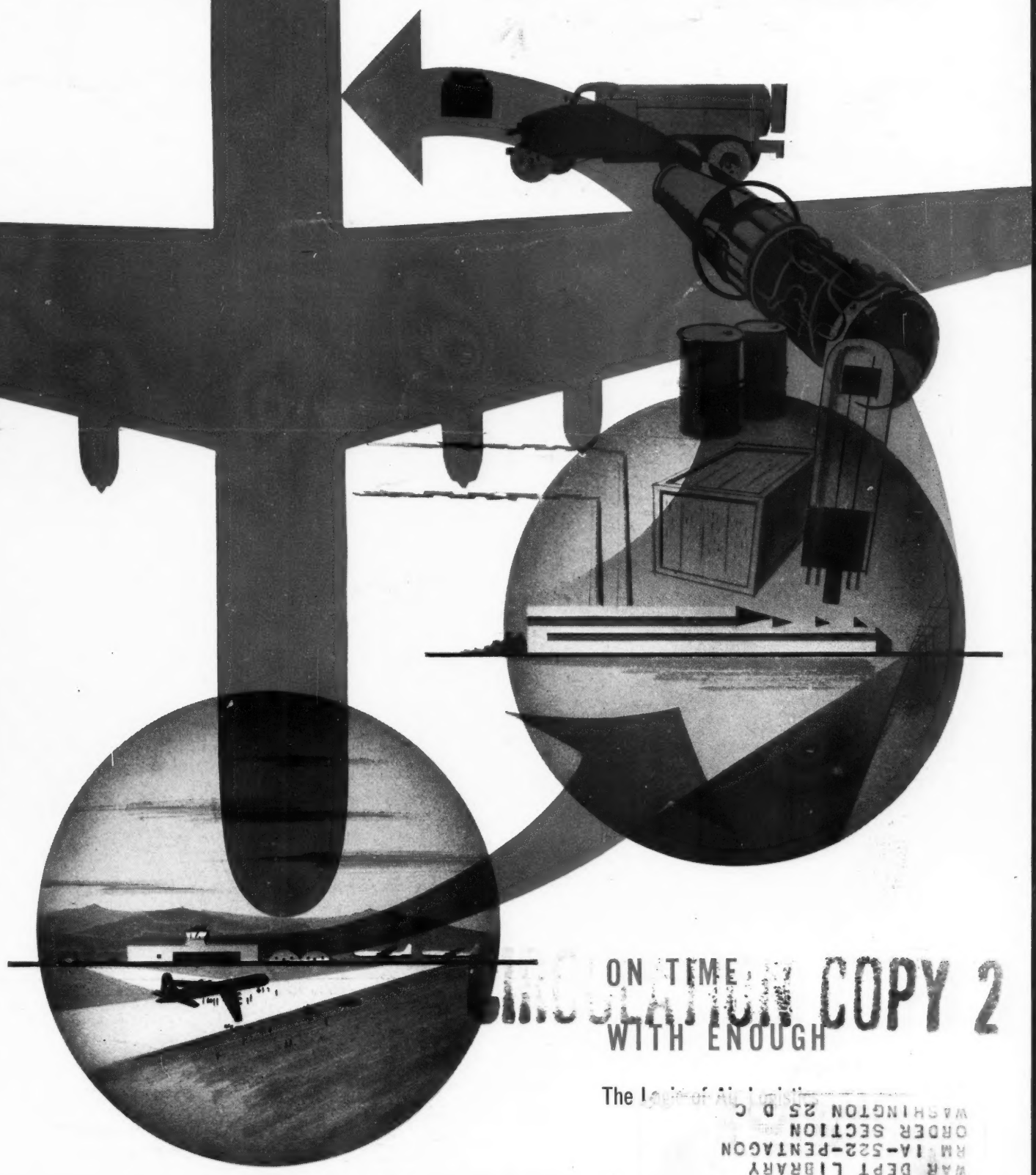

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America's first production B-52 rolls out!

The defenses of freedom gained added strength when the first production B-52 rolled out of Boeing's Seattle plant. Behind this historic Stratofortress, other giant B-52s are taking shape.

At the roll-out ceremony, General Nathan F. Twining, Air Force Chief of Staff, described the Stratofortress as "the long rifle of the air age." The very existence of these global jet giants is a powerful deterrent against attack, for they are designed to deliver devastating retaliatory blows deep behind any aggressor frontier.

The Boeing Stratofortress is capable of carrying nuclear weapons. It has a gross weight of more than 350,000 pounds and measures 185 feet from wing tip to wing tip. It is 153 feet long, and its towering 48-foot tail folds down to pass under hangar doors.

Power is supplied by eight Pratt & Whitney J57 jet engines installed in pods below the wing. Performance details of the B-52 have not been revealed.

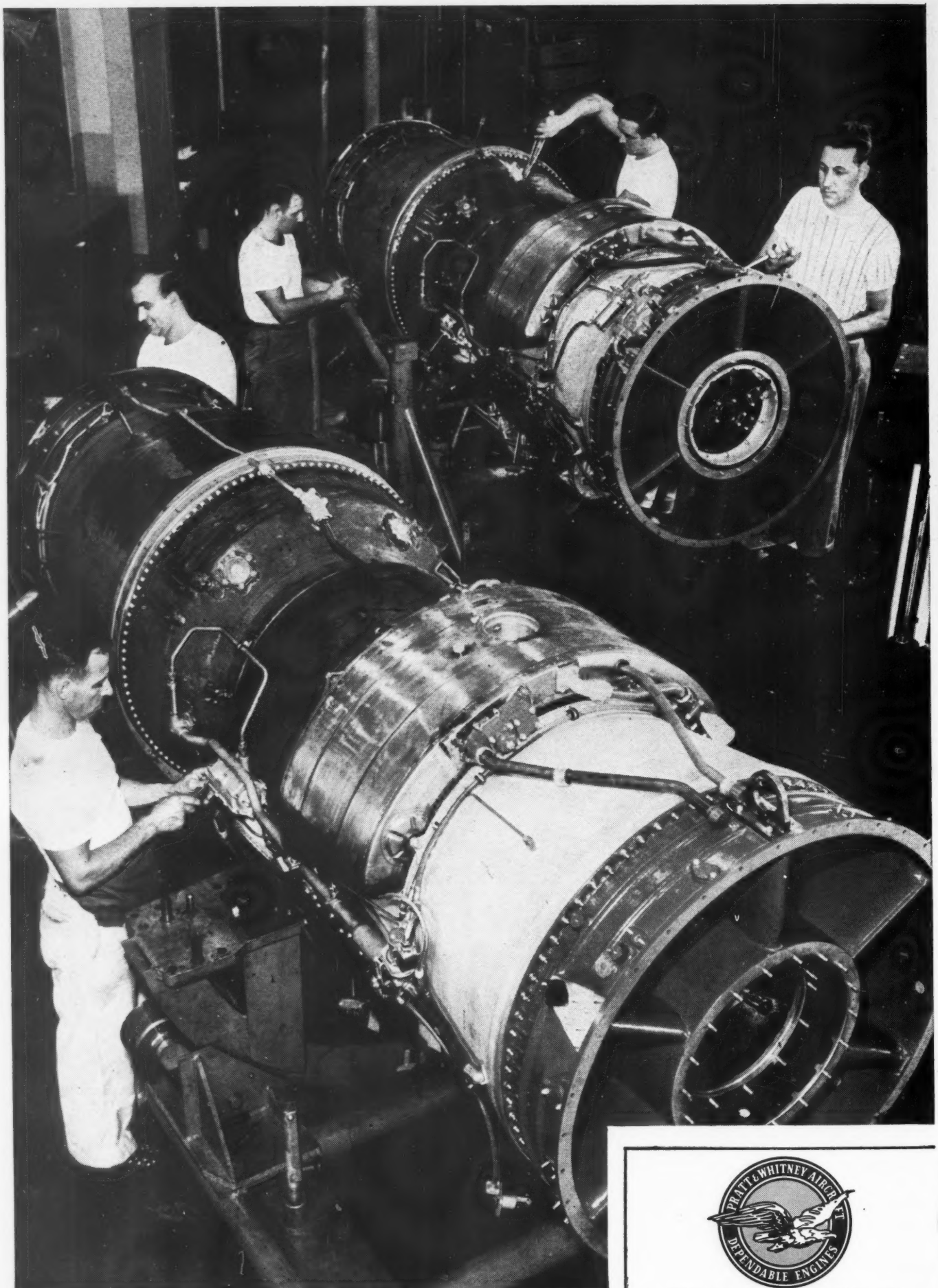
So promising was the original Stratofortress design that it was ordered into production months before the first experimental model had flown. In 1952, two prototypes began an intensive flight test program.

They have proved themselves so satisfactory that the Air Force declared the airplane "ready for expanded production." Boeing's Wichita (Kansas) Division was designated the second source of B-52s.

Once again Boeing's pioneering design, research and production have added new strength to freedom's voice.

This crest is symbolic of the Strategic Air Command's strength and global achievements. It is found on such Boeing planes as the B-29, B-50, KC-97, B-47—and now on the B-52.

BOEING



Pratt & Whitney Aircraft's J-57, the most powerful jet in quantity production, provides a new kind of power for the F-102 and for a whole generation of aircraft.

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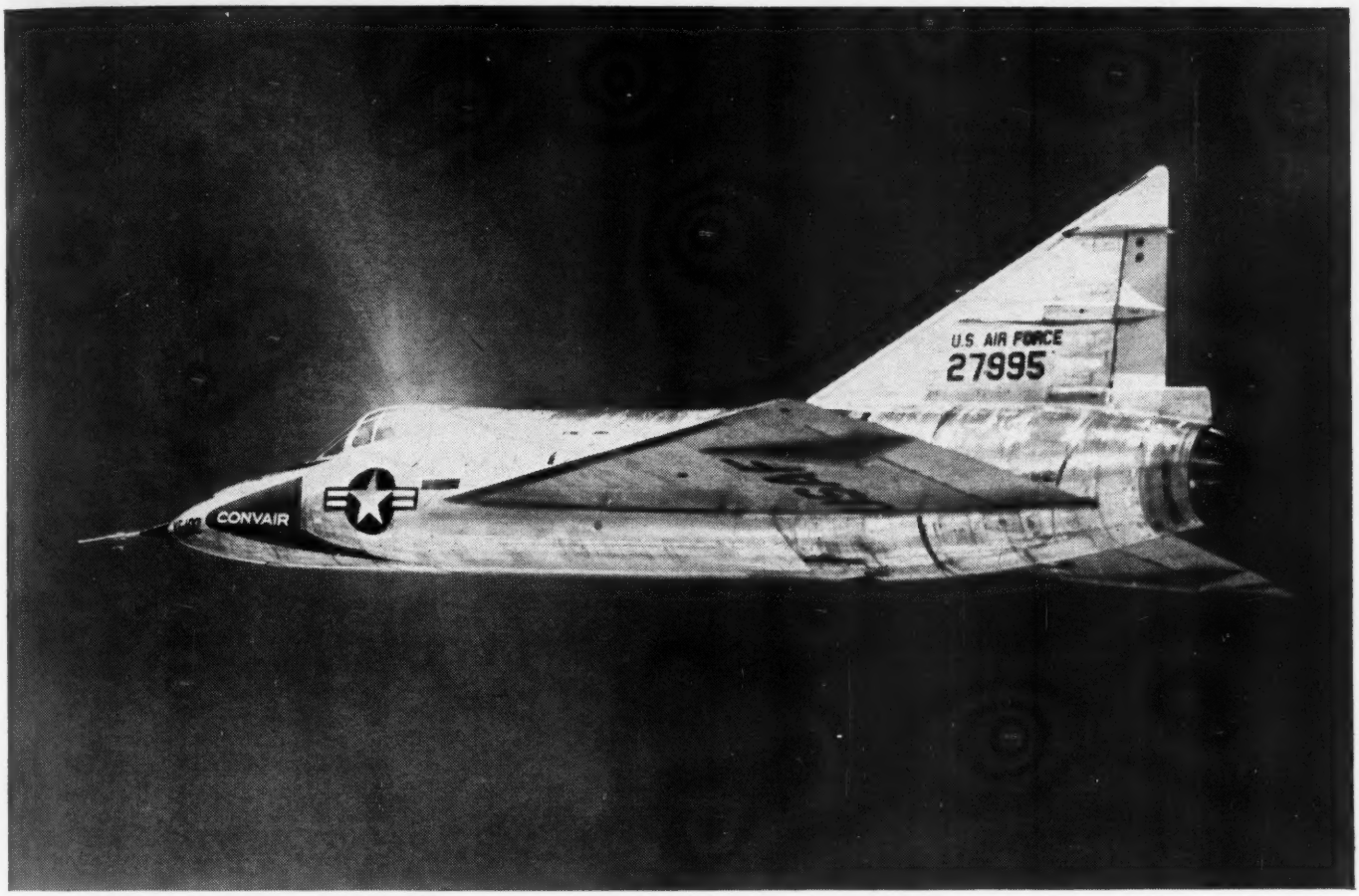

Sun glints from the canopy of this F-102, prototype of the first delta-wing, all-weather interceptor. It was designed and built for the U.S. Air Force by Consolidated Vultee Aircraft, and is powered by the Pratt & Whitney Aircraft J-57 with afterburner.

New Convair Interceptor Now Being Proved in Flight

The Convair F-102, an interceptor with a "new look" and powerful capabilities, is being proved as another major addition to America's vital air strength.

In reality, the F-102 is a new Air Force weapons system. To design and develop it, Convair utilized a unique combination of delta-wing aerodynamics, advanced electronics, ultra-modern fighter armament, and the most powerful turbojet engine now in quantity production, the Pratt & Whitney Aircraft J-57.

Excellent rate of climb as well as phenomenal speed in level flight are two of many significant F-102 characteristics which foretell its important future role in this nation's air defense. Here the huge thrust, fast acceleration and economy of the big J-57 make vital contributions to the aircraft's total capability as a weapons system.

In the F-102, as in other Air Force and Navy supersonic fighters and all-jet bombers, performance of Pratt & Whitney Aircraft's J-57 is fully justifying the years of intensive effort required for its design, development and production.

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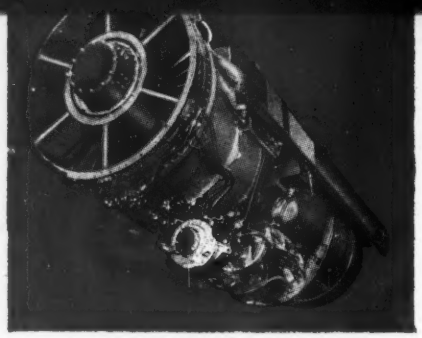

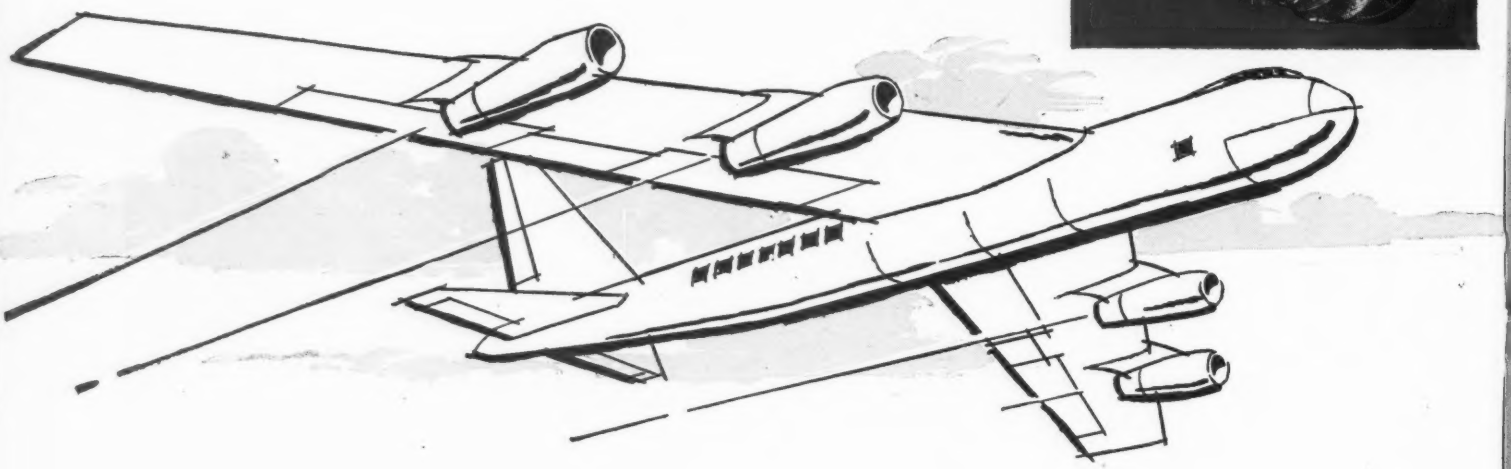

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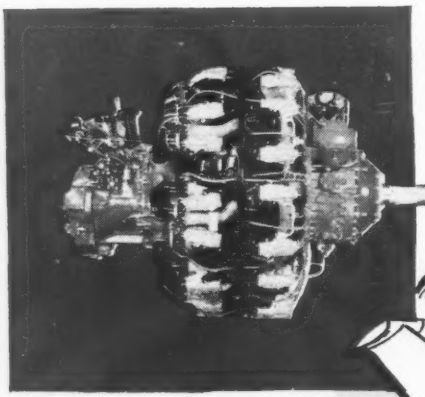

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AIR MAIL

What of the M-Dayers?

Gentlemen: The article "What Gives With the Reserve Program" in the April issue of AIR FORCE has finally brought out some of the facts which have been a tune on my harp for some time.

Having participated as an active Reservist since 1949, with two different "M-Day" assignments, I've had to fight every inch of the way for any training or benefits from training in maintaining my minimum requirements. There have been pitfalls in lack of directives, regulations, and indifference on the part of personnel in charge of Reserve training.

During the first fiscal year, we were authorized forty-eight paid training periods as a minimum. After four months of on-the-job training we became an integral part of the unit during our training. The next two fiscal years we were cut to twenty-four and following the trend downward to where we are now authorized on twelve periods with a minimum of twenty-four authorized paid and unpaid periods. At the present rate the man hardly gets his hat off when it is time to leave, and then nothing has been accomplished toward justification of the training purpose or satisfying yourself the effort was well spent.

I am a firm believer in "incentive breeds initiative," but any incentive previously given to the active member is becoming a thing of the past. In reference to the article it is stated that with the advent of the new training centers, the men will be authorized twenty-four paid drill periods and fifteen days active duty, yet very little was mentioned, if anything, about the "M-Day" assignees. Last year your magazine published Gen. Leon Johnson's survey and his recommendations, which included, among other things, that all Reserve training units and "M-Day" assignees be given an authorized minimum paid training periods of twenty-four to be of any benefit to the Reservist or the Air Force. Finally the larger portion of the members are coming to the fore in this new program, more power to them. But what about those of us who have been and will be in established on-the-job training?

Harold E. Wear
San Bernadino, Calif.

Special Training Devices

Gentlemen: In the March issue of AIR FORCE in "Airpower in the News" you featured an article on Economy of Special Training Devices. In general, this is an excellent article and we, in the Air Force Special Training Devices business, greatly appreciate your informing the public of the benefits of our program.

However, we feel that part of the item which reads, "All such devices permit vital AF training without need for *actual flights*" is misleading. It is the official position of the Air Force that flight simulators, radar bombing trainers, and navigation and gunnery trainers *supplement* in-flight training but are not capable of *taking the place of* actual flight training. The Air Force uses these devices to:

1. Minimize the increased expenditure of flying hours needed to achieve full operational qualification of our combat crews in the highly complex airplanes of today.

2. Furnish comprehensive ground training in emergency flight procedures which for safety reasons cannot be practiced in actual flight.

3. Reduce airplane accidents.

4. Assist, in complete safety, to improve the proficiency of the airplane crew by providing constant practice in normal aircraft operation, radar bombing, navigation, and aerial gunnery.

Col. Anthony J. Perna
Chief, Special Training Devices Div.
Department of the Air Force
Washington 25, D. C.

Wants Pix Also

Gentlemen: First of all, I want to express my sincere appreciation for the many fine stories and articles published in your wonderful magazine, AIR FORCE. I use each issue as an excellent source of current information for my AF-ROTC classes. The feature "Airpower in the News" is extremely useful, not only in preparing the latest current data and Air Force trends, but also in keeping up with the USAF for my own benefit.

May I make a suggestion that would help *all* AF-ROTC units? If AIR FORCE would publish some pictures, suitable for mounting on a mat as a series, of Air Force fighter-type aircraft, and also bomber-type aircraft, from the early models right through to the latest, *viz.*, the F-102 and the B-52, it would provide an excellent history of our aircraft for all AF-ROTC cadets to see. I would recommend two pictures per page, but not published back-to-back so we would have to use too many copies in order to get prints of each type plane. That would be about the most convenient size, in my opinion.

I used the double-page spread of all Air Force winners of the Congressional Medal of Honor and put it on a blue cardboard background, then framed it in a large frame and it makes a most impressive picture. However, it is out of date, as Maj. Charles Loring and Lt. Col. George Davis were not included on this double-page spread. [Nor was Capt. John Walmsey, the fourth AF Medal of Honor winner from Korea. See page 12.—The Editors.]

Also, we use the organizational charts (with pictures of the persons concerned) to good advantage at our unit. I hope you continue that practice because it not only gives the AF-ROTC cadet an excellent idea of Air Force organization, but it also serves to keep all Detachment personnel current on the latest Air Force leaders.

Keep up the good work. AIR FORCE Magazine is tops with me.

Maj. Bert McDowell, Jr.
Assistant PAS&T
Baylor University
Waco, Tex.

ARDC Chart

Gentlemen: I have just finished reading the April 1954 issue of AIR FORCE. As usual there are many articles of interest in each issue and I enjoy reading the magazine very much.

One feature of your magazine is always of greater interest to me than to many other readers. The organizational charts for the various commands interests me particularly because I am in the Manpower and Organization Office at the Air Force Missile Test Center and organizational charting is part of our

(Continued on following page)

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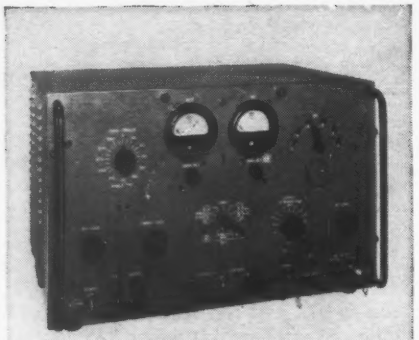

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business. I therefore perused with great interest the new chart for the Air Research and Development Command. When I came to our Center I looked and then looked again as it did not resemble anything I knew that was correct as of March 8, 1954. I do not know your source of information but in this instance it is erroneous so far as the Air Force Missile Test Center is concerned. As of March 8, 1954 there was no 6541st Missile Test Wing nor has there been since April 1953. Item 49, Maintenance and Supply, is also erroneous. This could be correctly labeled 6550th Maintenance and Supply Group, but why show this group without mentioning the 6555th Guided Missile Group, the 6550th Air Base Group, the 6550th USAF Hospital, the 6550th Installations Group, and the 6541st Operations Group (Range)?

There are many different ways in which this might have been presented, and, not being an official spokesman, I have no thought as to the manner in which it is desired to be presented. It would, however, appear to me that some officials in the Air Force chain of command could give better information on such matters as organization than others, and the proper place to get this information is from Manpower and Organization at any level.

Capt. Charles M. Little
Patrick AFB, Fla.

• *Material for our chart was submitted by AFMTC, but we'll have to admit that Captain Little is right—6541st Missile Test Wing should have read 6541st Operations Group. Space limitations, however, did not allow for inclusion of the medical group, installations, etc.—The Editors.*

Motion Seconded

Gentlemen: Here is a hearty second to Jean Louis Des Jardin's letter, in the April issue of AIR FORCE, suggesting that you print more pictures of aircraft. Most of the pictures of our jets can be found only in advertisements, and these planes are too old to be interesting. Take, for instance, the F-102. I have only seen one picture of it, and I am sure there must be more to be gotten by a magazine such as yours.

Congratulations on the magazine on the whole, though, especially "Tech Talk" and your editorials.

Donald Scharfe
Pittsburgh, Penna.

Praise Department

Gentlemen: For the past few years I have been privileged to receive AIR FORCE, official magazine of the Air Force Association. I sincerely wish to thank the Twin City Squadron for sending me this informative periodical.

I have found this magazine to be the source of invaluable information in both military and civil defense fields. By reading it each month, I am able to keep abreast of Air Force activities and up-to-date on new developments in the field of aviation.

Eric G. Hoyer, Mayor
City of Minneapolis
Minneapolis, Minn.

Gentlemen: Words of praise are too seldom written—somehow gripes, complaints, and vituperation find more ready expressions by the pen.

May I take this opportunity to praise you for your magazine AIR FORCE. You have excellent broad coverage of Air Force problems and air doctrine, the "gripe" section provides a good measure of public response to these problems, and your short news items about current Air Force "doings" are especially appreciated.

I have come to the point where I'm tired of going to the college library in order to read the latest copy of AIR FORCE. As a new AF Reserve second lieutenant I feel that I owe it to myself to have more ready access to the one magazine in America which supports strong airpower. So, therefore, please put me down for membership in the AFA and a subscription to your magazine.

Will B. Allanson
San Diego, Calif.

Physical Education, Too

Gentlemen: This letter is prompted by the article "Let's Educate Our Officer Corps." In light of world conditions this seems to be a basic need.

One thing that is overlooked by the many who want the educational program is the subject of "self-respect." Today, too many of the officers and men are guilty of personal sloppiness to a degree that is not understandable. How very often I have gone into a restaurant or walked along the street and seen men in uniform with their collars open, sleeves rolled up, or some part of their clothes torn. How often I have wondered who the inspecting officer was who let a man get by with hair grown long, sideburns running down to his lower ear, and clothes pressed by a barrel.

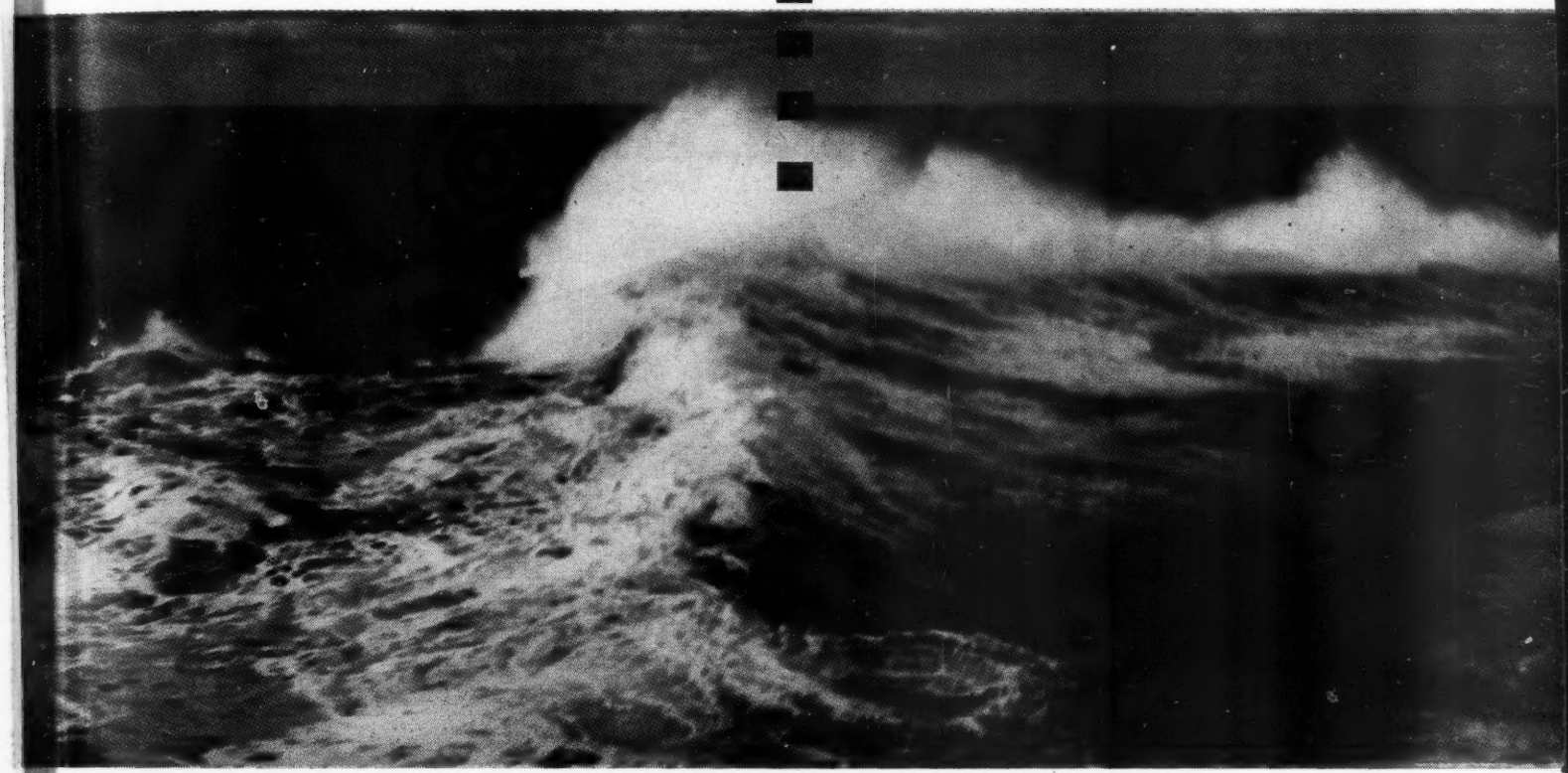
Personal pride and self-respect are a necessary part of any organization. The officers who lead our men should be indoctrinated in the care and maintenance of the body and the clothes worn by those in their command. The officer who walks in front of his men should be the example his men strive to copy. The officer who represents the United States should be a mark of perfection, not only in education but in personal dress and hygiene as well.

General Smith has the right idea when he talks of educating the Officer Corps. It is my hope and belief that this education should not only deal with technical subjects but should include the very necessary lessons of personal appearance and respect.

Bertram L. Steinberg
Brooklyn, N. Y.

(Continued on page 9)

TOP SECRET



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The B-D Biplane

Gentlemen: I enjoyed the article by Frederick W. Keith "By the Seat of My Pants—Bell Bottoms, That Is," and the recollections of early days in naval aviation. I cannot, however, help but offer a correction to his article. It is a minor one because I know but little of naval aviation.

The correct name of the pusher type biplane which author Keith refers to is "Burgess-Dunne." I had reason to know of this aircraft and as a boy of fifteen saw several of them at the factory where they were produced. The Burgess-Dunne was built in Marblehead, Mass., by the Burgess Yacht Company. This yacht company had entered aviation by becoming one of the licensees for the manufacture of the Wright Model B pusher type biplane. They added one or two details to the old Wright under direction of the Wright Brothers and most test flights of the Burgess-manufactured Wrights were held in my home town of Saugus, Mass.

When Dunne came out with his pontoon float design, Burgess saw the opportunity to more closely associate his aircraft manufacturing with his manufacture of yachts—and after negotiations were completed, commenced the manufacture of the Burgess-Dunne biplane.

Mr. Keith in his article indicates that the Burgess-Dunne was very unstable; however, the Burgess company advertised the stability of this airplane which they claimed was due to its sweptback wing and lack of a tail assembly. To prove their point, they would have a demonstrator pilot set the plane in a bank, leave the controls, and walk out onto a wing while the plane continued in slow circles over the crowd below.

Lt. Col. Harry J. Jenkins
Kansas City, Mo.

• *I cannot rightly say whether the name of the seaplane in question was "Burgess-Dunn" or "Burgess-Dunne" as Lt. Col. Jenkins has it. Both my log books—which is no criterion—and a book I own entitled "Flying Officers of the U.S.N." (published 1919) refer to it as a "Burgess-Dunn."*

He states that I indicated in my article that the B-D was "very unstable." If such is the case, it was not my intention to do so. In fact, I was in no position to judge whether it was stable or unstable as my one and only flight in one was of ten minutes' duration.

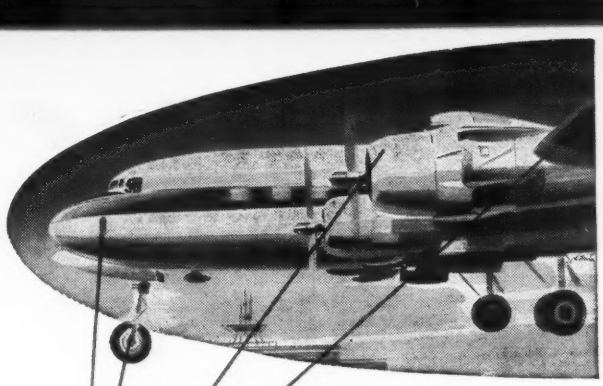
—Frederick W. Keith

General Van

Gentlemen: I would like to take this opportunity to congratulate you on the very fine tribute paid General Vandenberg in the May issue of AIR FORCE Magazine.

He was a great Air Force leader and it is gratifying to see him so well remembered.

Richard S. Boutelle, President
Fairchild Engine & Airplane Corp.
Hagerstown, Md.



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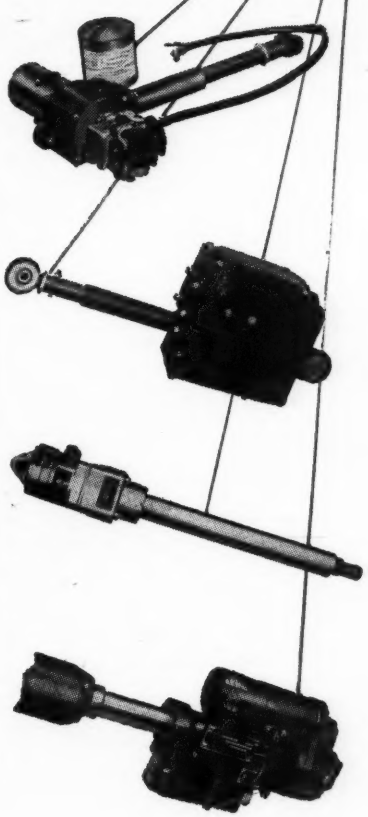

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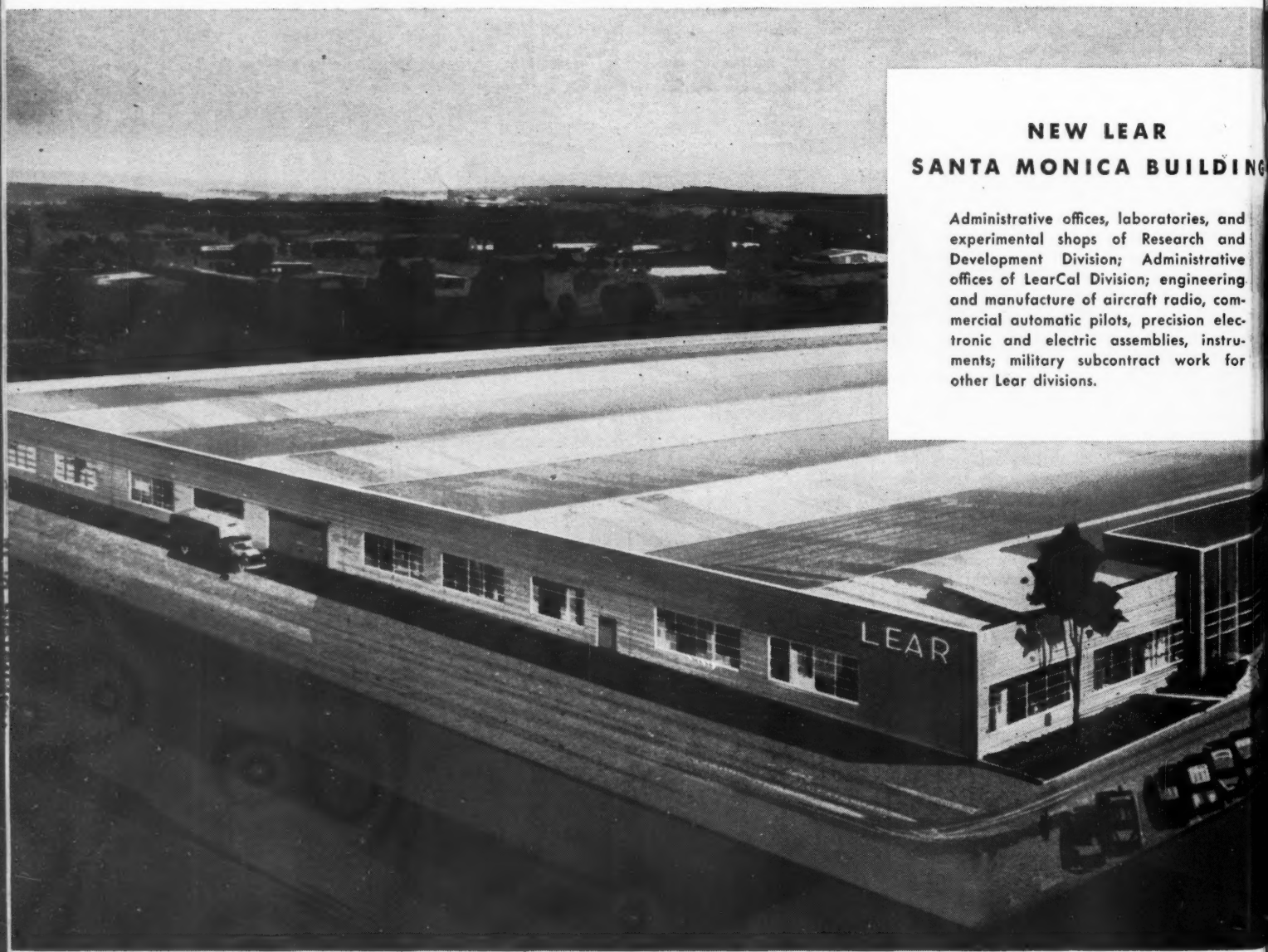

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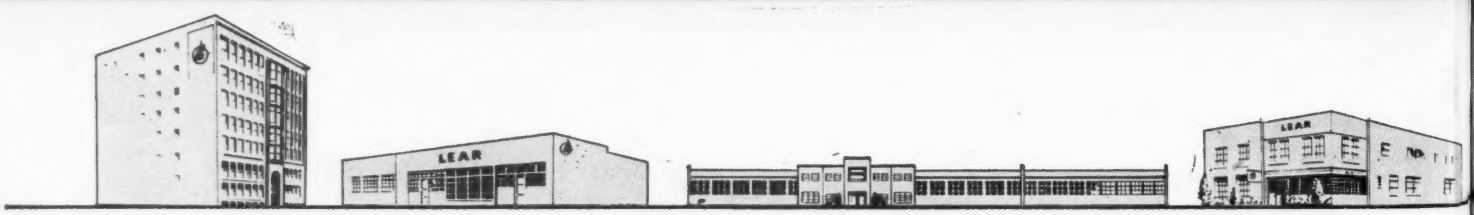

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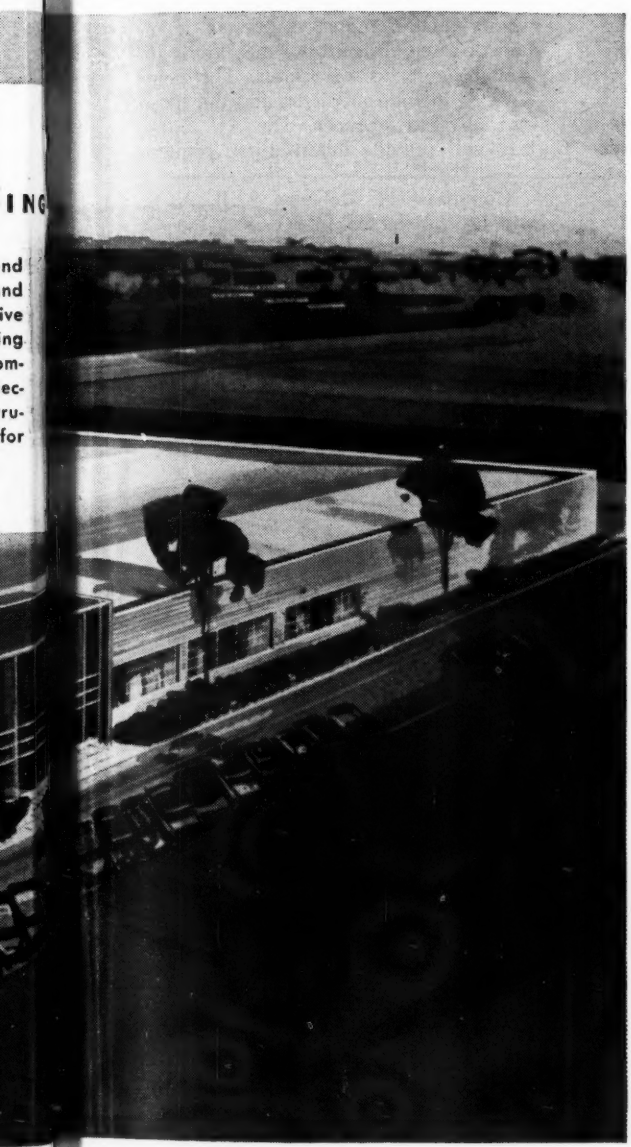

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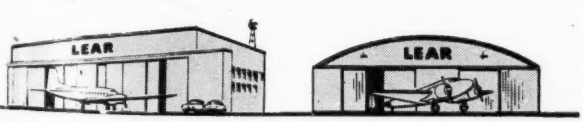

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AIRPOWER IN THE NEWS

AF Secretary Talbott presents Medal of Honor to widow of Maj. Charles Loring and her two daughters, Aldor, 5, and Charlene 3, at Bolling AFB.

When the shooting stopped in Korea, there had been only one Air Force **Congressional Medal of Honor** winner. He was **Maj. Louis J. Sebille,** an F-51 pilot who had dived his Mustang into a Korean target in August 1951. Then last December the Air Force announced a second winner of the nation's highest award: **Maj. Charles J. Loring,** who died in November 1952 after crashing his F-80 into an enemy gun emplacement near Sniper Ridge, in Korea (see AIR FORCE, January 1954). Last month Air Force Secretary Harold E. Talbott presented Major Loring's medal to Mrs. Loring and the couple's two children in a ceremony (see cut) at Washington's Bolling AFB. Now two other Air Force Medal of Honor winners have been announced, both posthumously, bringing to **forty-six** the all-time total number of Air Force winners of the award.

One goes to **Lt. Col. George A. Davis, Jr.,** F-86 Sabrejet pilot, of Lubbock, Tex., long the top jet ace of the Korean air war, with a record of eleven MIG-15s and three TU-2 bombers shot down, who was shot down himself February 10, 1952, on his sixtieth mission. On that day Davis, then a major, and his wingman single-handedly took on a formation of twelve MIGs in order to protect slower US fighter-bombers operating at ground level beneath them. Davis shot down two MIGs, then was hit and crashed out of control while attacking a third.

The fourth Air Force Medal of Honor from Korea goes to bomber pilot **Capt. John S. Walmsley, Jr.,** of Silver Spring, Md., whose B-26 was shot down on September 14, 1951, on Walmsley's twenty-fifth combat mission. He had disabled an enemy train but ran out of ammunition before destroying it. When another bomber reached the scene, Walmsley snapped on a newly developed searchlight on his plane to light up the scene, though in doing so exposed himself to the heavy flak and ground fire that finally downed his bomber.

The Air Force's new **Deputy for Reserve and ROTC Affairs,** under Assistant Secretary H. Lee White, is **John Lerom,** who took office May 1, succeeding Chester D. Seftenberg. Lerom, who lives near Washington, D. C., is a member of the Air Force Association's National Air Reserve Council. A World War II colonel, whose last active-duty assignment was staff operations officer, Hq., AAF in Europe, Lerom was executive secretary of the joint committee of the Civil Aeronautics Administration and Civil Aeronautics Board before his appointment to the State Department in May 1953. He'd also spent five years as Air Adviser to the Republics of Peru and Panama.

Lt. Col. George A. Davis. A Medal of Honor for a top killer of MIGs.

Fourteeen **key metropolitan target areas** in the US have been earmarked for protection against enemy air attack and will be guarded by the Army's Nike, **anti-aircraft guided missile,** at a projected cost of $75 million. The cities include New York, Washington-Baltimore, Philadelphia, Boston, Norfolk, Va., Cleveland, Chicago-Detroit, Colorado Springs-Denver, Hanford, Wash., Seattle, Los Angeles, San Francisco, and one unnamed site. Each defense area will have up to four Nike battalions, each consisting of four firing batteries.

The **Air University** has announced its second series of one-year **research awards** for 1954-55 for Research Assistants ($3,410 to $4,205 per year) and Research Associates ($5,060 to $7,040 per year). Assistantships go to graduate students ready to begin research on doctors' dissertations, while college or university faculty members or staff members of research institutes may apply for appointments as Associates. The fields covered include medicine and the social and physical sciences. The AU Secretary will provide details upon request.

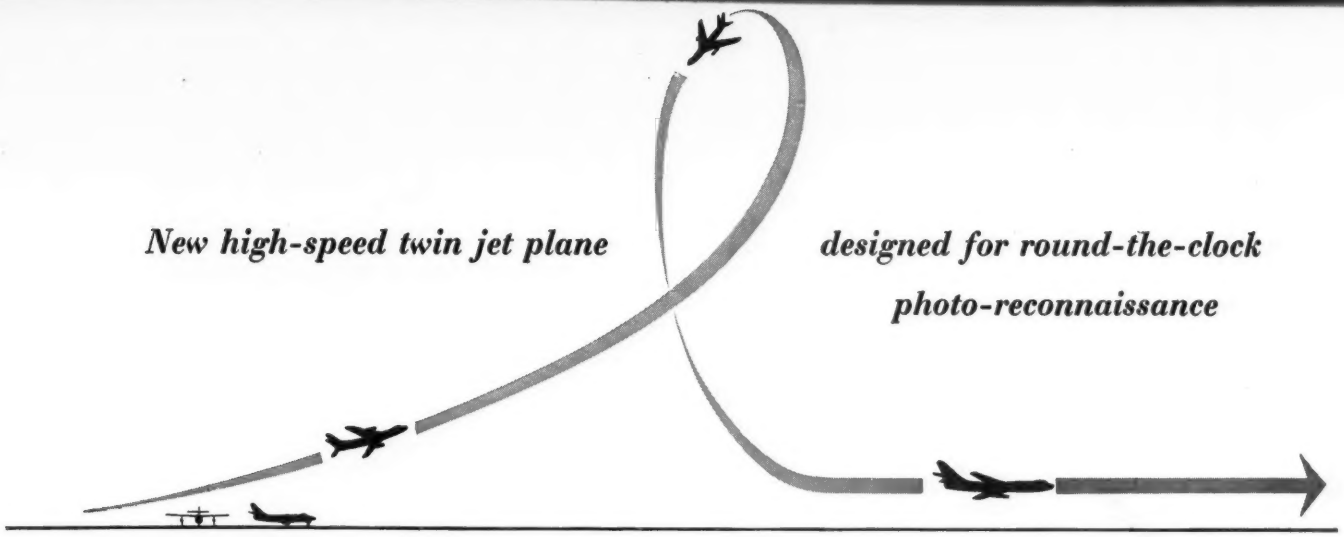
Command of **McGuire AFB, N. J.,** will be transferred July 1 from the Air Defense Command to **MATS** in a move that will also later see the New Jersey base become headquarters of the Atlantic Division of MATS, now located at Westover AFB, Mass.

The **last active ace of World War I** retired last month. Earlier **Col. Edward M. Haight** had taken a demotion to master sergeant in order to complete his thirty years of service. In World War I he'd shot down five German planes, and in World War II commanded the 13th Air Service Group in the ETO. In 1942 he was commander of Randolph AFB, Tex. A victim of the economy wave of 1949-50, Colonel Haight had to choose between becoming an enlisted man or leaving the service four years before his retirement time. He took the demotion and was assigned to the USAF School of Aviation Medicine.

Capt. John S. Walmsley, Jr. A Medal of Honor for a heroic B-26 pilot.

The retirement of another aviation pioneer saw **Vice Adm. John J. Ballentine,** who made the early tests on the **Norden bombsight** in 1924, leave active naval service. He retired as commander of the Atlantic Fleet air arm after forty years of service that included command of the Navy's first "baby flattop," the carrier *Long Island*.—END

New high-speed twin jet plane *designed for round-the-clock photo-reconnaissance*



—the Douglas RB-66

Now in production for the U. S. Air Force, the Douglas RB-66 will be one of the most versatile photo-reconnaissance planes ever designed.

Complete performance data is still restricted, but this much can now be told. Powered by twin jets, slung in pods from its sharply swept wings, RB-66 will fly in the 600- to 700-mile-per-hour class. Range will permit deep penetration for all-weather, around-the-clock photo-reconnaissance or mapping. Photographic equipment will be of the most modern to collect detailed information by day or night.

Development of RB-66 is another example of Douglas leadership in aviation. Planes that can be produced in volume to fly *faster and farther with a bigger payload* are a basic rule of Douglas design.

Enlist to fly in the U. S. Air Force

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BRITANNIA *to be built in* CANADA

It has been announced that a license has been signed with the Canadian Government to manufacture the "Bristol" Britannia in Canada.

Canadair Limited in Montreal has been authorized to build a maritime version of the "Bristol" aircraft.

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The "Bristol"

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Shooting the Breeze

IN THE last year we've published a number of articles by our Ed Hogan, ranging all the way from contributions made by the military in the progress of aviation to his latest effort, "On Time With Enough," which begins on page 25. Ed swears his next piece will be titled, "Prisoner of the Wind."

This sounded peculiar to us, too, when he first mentioned it, but maybe our much-traveled boy has something after all.

To get much of the information for his current article on logistics, Ed made a tour of NEAC installations in Newfoundland, Labrador, and Greenland, where Thule is.

It seems that every so often a low pressure area moves into Greenland and this stirs up something called "Foehn" winds. These winds blow down from the Greenland ice cap and when this happens, Ed tells us, it snows horizontally at Thule.

In very high winds, people stay indoors, lest they get blown into North Star Bay. Well, the winds got up pretty high the day after Ed landed and he spent three days holed up in a room. Except for pitting his 160 pounds against them at meal times. Never misses a meal, that Ed.

We're glad the winds stopped blowing when they did. He barely got back for our edition deadline.

Now that he's thawed out, we're thinking of sending him to Texas for an article we have in mind.

He'll be easy to spot. He'll be the guy wearing a parka and mukluks.

AIR FORCE

THE MAGAZINE OF AMERICAN AIRPOWER

Vol. 37, No. 6 • JUNE 1954

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THE COVER

The logic of air logistics, we think, is concisely summed up in the phrase "On Time with Enough." The full cycle of air logistics and its various relationships is represented on our cover this month—from the man who needs the item to the man who makes it and back to the user—all by air. Jack MacLeod's cover design was executed by Lanman Art Service. The air logistics story begins on page 25.

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By Wilfred Owen

How much work does the average twin-engine transport do in fifteen years of airline operation? According to the Aircraft Industries Association the typical plane has been in the air six and a half years out of the fifteen, has traveled 8½ million miles, and has carried 200,000 passengers.

° ° °

Sabena Belgian Airways has developed a new use for its helicopter fleet. Flower lovers are whisked from Brussels to the tulip fields of Holland, where they may hover over the blossoms at close range and enjoy a truly bird's eye view of the flowers.

° ° °

Civil aircraft in the United States spent 8,800 hours in the air last year hunting lost persons.

° ° °

Last year US airlines carried 700,000 passengers on the family plan.

° ° °

The direct cost of flying a big four-engine aircraft 100 miles is $1.20 per plane-mile.

° ° °

The airlines serve thirty-six cities in California, but eighty-five percent of the traffic is out of San Francisco and Los Angeles.

° ° °

Pan American has made 29,000 transpacific flights.

° ° °

Some of the latest aircraft models are carrying plenty of weight. At Philadelphia's International Airport an H-21C Workhorse helicopter has lifted a 4,610-pound load. That's one of the models Piasecki has been making for the Air Force. And from Westover AFB comes word of one of the biggest hauls ever made by air—a Douglas C-124 Globemaster II airlifting a 29,814-pound Caterpillar tractor all the way to Greenland. Delivery was by MATS.

° ° °

The latest statistics on the airline stewardess comes from American Airlines, whose more than 1,000 sky girls provide a fair statistical sample. The latest graduating class of 128 averages twenty-two years, five feet four inches, and 115 pounds per stewardess. Gentlemen travelers who prefer blondes will find only fourteen brunettes and seven redheads in the group, the rest of the 128 being what American classifies as blonde-to-brownette.

° ° °

Here's a new use for the lightplane. From Flushing Airport comes word that folks who are cremated like to have their ashes scattered by air. Last year there were thirty-five to forty flights that involved dropping people's ashes over such specified targets as the Atlantic Ocean.

° ° °

When a 25-year-old Dutch passenger en route from the Netherlands to Australia requested permission from KLM Royal Dutch Airlines to parachute from the plane with his wife, he explained that landing at Sydney would require a two-day train trip back to their actual destination.

° ° °

According to figures of the Aircraft Industries Association, the wings of a modern jet bomber could support a stack of Cadillacs as high as the Washington Monument.

° ° °

Ten thousand people earn their living at Washington, D. C.'s National Airport.

° ° °

Now that tourist fares across the Pacific have been agreed upon, a flight around the world will cost about $1,100.

° ° °

By dropping 10,000 brightly colored plastic envelopes into the North Atlantic, oceanographers hope to learn more about ocean surface currents. Aircraft from the British Coastal Command will drop the envelopes at various seasons, and persons recovering them will find a postcard questionnaire to mail back.

° ° °

Each year British Overseas Airways carries about 130,000 animals, birds, fish, and reptiles.

° ° °

The US oil industry, with 1,723 planes, operates more aircraft than all US domestic and international airlines.

° ° °

Airplane pilots in the vicinity of Washington, D. C., are complaining about the polluted air. According to the Aircraft Owners and Pilots Association this is no reflection on Washington, because the smoke and chemical residues the flyers complain about drifts all the way over from Baltimore and Philadelphia.

° ° °

Because snow causes a change in the level of the ground, it may cause a bend of approximately one degree in the glide path of an instrument landing system. Now a new-type antenna has been devised that is practically unaffected by snow.

° ° °

The Civil Aeronautics Board now has forty-seven applications in for helicopter service, including New York to Philadelphia, Dallas to San Antonio, and routes within a seventy-five-mile radius of New Orleans. Another would serve Detroit, Cleveland, Akron, and Youngstown.

° ° °

Chicago's O'Hare Field, slated to be the biggest in area in the US, will have a 2-story terminal with covered movable bridges to permit passengers to board planes from the second floor.

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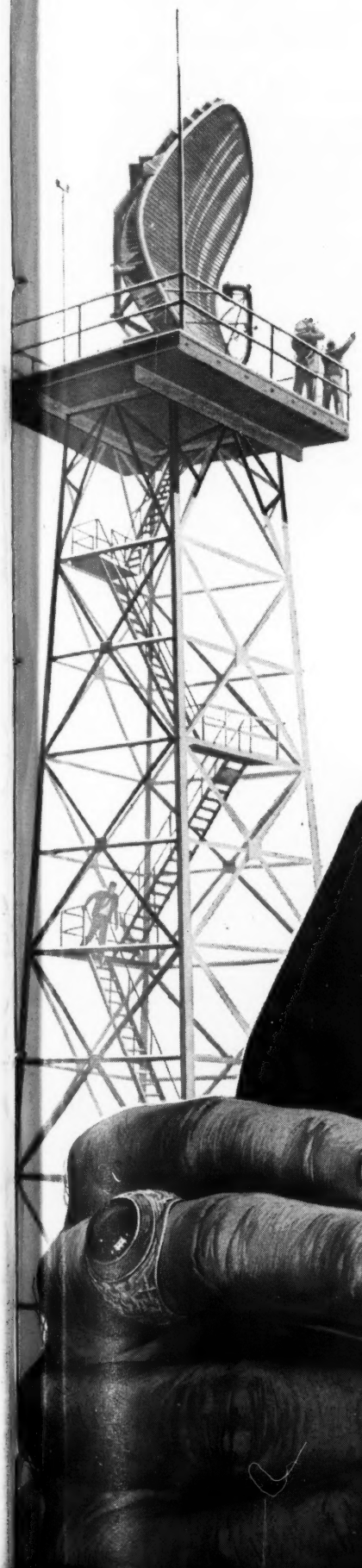


A Businessman Looks at

Fringe Benefits

By J. E. Schaefer, Vice President, General Manager Wichita Division, Boeing Aircraft Company

At a time when getting and keeping the highly skilled individuals necessary to carry out the Air Force mission is most perplexing, it is refreshing and encouraging to find that the problem can be articulately analyzed by a hard-headed businessman, who finds ample justification for so-called "fringe benefits" from a dollars-and-cents point of view. The opinions below were condensed from talks made by Mr. Schaefer in Kansas City, Mo., and San Antonio, Texas.

IT IS the personnel aspects of our armed services which, at the moment presents one of our most perplexing problem areas, and which well deserves our immediate sympathetic and concentrated attention and interest. . . .

Secretary Talbott, in one of his first pronouncements after he became Air Force Secretary, pointed up part of the Air Force problem very well. He put it this way: "It requires $14,000 per capita to develop an airman. That is, of course, an average. If a fair percentage of these men don't reenlist, this investment to a large degree is lost, and the Air Force has to turn around and develop another group at $14,000 per head." The Secretary went on to say that the Air Force is now losing 180,000 men a year, and at the cost of $14,000 per capita for training each man, it multiplies out to a two and a half billion dollar loss per year. . . .

Now the Secretary did some investigating, and I too did a little on my own. Secretary Talbott found, as I have found, that the provisions we make for the well-being and the morale of those serving the defense of our country, need attention. Many of these provisions come under the heading of "fringe benefits."

Let us, for example, consider the value of commissary and post exchange privileges. These constitute an important element in building and keeping good military morale. Investigation shows that commissary and PX privileges in some instances have been abused. Even if this were universally true, which it isn't, wouldn't it be better to correct the abuses and stimulate military morale rather than do away with commissaries and post exchanges entirely, to the detriment of that morale?

There has been a trend, in the interest of economy, toward trimming down many other service benefits. The program of medical care for servicemen's families is being questioned. The policy on cumulative leaves for service personnel has been made less favorable. Allowances for moving expenses have been drastically cut. Military retirement estates, like those of civilians, have been subject to inflationary impact. How many of you realize that an officer's widow does not share in his retirement pay after his death? This to me is a shameful way to treat loyal women who have spent their lives as much in the service of their country as their distinguished husbands.

Another area which is particularly sensitive is that of housing—*housing on the base or post* for officers and non-commissioned officers. I know of six officers, all West Point graduates —all patriotic, dedicated, and capable officers—all recently resigned primarily because of housing problems.

Many of the officers who are leaving the service are doing so *not* because they do not like their work. They are leaving because their wives are plain "fed up" with living conditions that make domestic harmony extremely difficult if not impossible. The divorce rate in the Strategic Air Command, I am told, at one time ran as high as sixty percent among flying personnel. While the rate is considerably less today, it still remains quite high, and points up the conflict that can develop between duty to country and family.

When you and I leave for work in the morning our families can reasonably expect us to follow certain routine schedules. We don't have to report to a flight line to receive sealed orders not to be opened until we are out so many minutes on an assigned course, and then find that we are to be away for days without any of our home folks knowing exactly where we are except by speculation.

To reduce or destroy to any degree armed service morale increases our vulnerability just as positively and just as surely as a reduction in armament beyond the point where a calculated risk becomes a disastrous and obvious mistake.

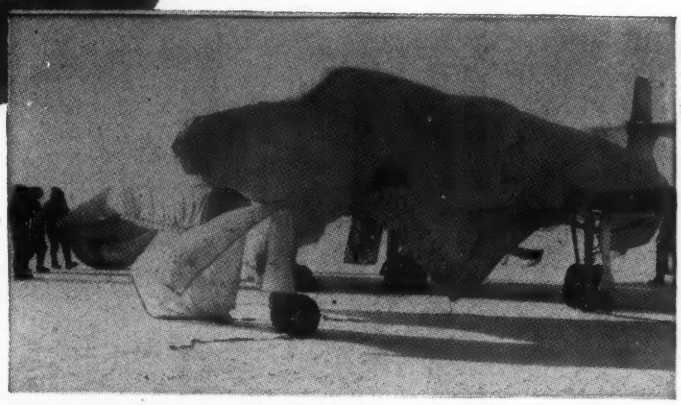
You might now very properly ask—why is he so interested in this problem? Well, first of all, I feel, as a taxpayer, that it is economically unsound to pay for the expensive equipment needed to defend our country unless we can attract and retain well qualified men on the ground to maintain that equipment, and equally well qualified men in the air to operate it.

The services, too, must make their contribution to this effort for general morale improvement. They must learn better to fit the square pegs in the square holes and the round pegs in round holes. They must be disposed to transfer personnel less frequently and with more consideration for some of the same factors we in industry have to consider to maintain high morale.

To sum up—may I suggest that we all become better acquainted with the problems of our armed services and help our Senators, Congressmen, and others in Washington and elsewhere overcome those problems? In many instances it requires only an attitude of understanding thoughtfulness. In others it requires aggressive action if the over-all, long-range interests of our country are to be properly realized.

The services, because they are becoming more and more technical in every phase, require increased professional treatment. They should, therefore, be made sufficiently attractive for the professional soldier to accept them and stay with them as a profession. Otherwise we are dangerously discounting the professional demands of the military to our serious detriment and possible doom.—END

for use ... at 60° below



The CF-100 with its ORENDA's was meant to fly and fight in the Arctic. So that's where it's been tested. In the bitter wind-searing cold, engines must start, controls move, radio be clear, guns fire, and the pilot's hands and feet be comfortable within minutes after a "Barren Land" alert.

It's routine now to leave a CF-100 out overnight with but a light wrap to keep the wings clear of frost. After a 15-hour "cold soak" in temperatures of 30° to 60° below they pull the wraps, flick switches and take off. If it's not cold enough at Namao, near Edmonton, they fly non-stop to Fort Churchill on Hudson's Bay.

Defender of the Arctic, the CF-100 is in squadron service with the R.C.A.F. at strategic bases. On daily flights, it probes the perimeter of those areas most likely to need watching.

This CF-100 has had overnight "Cold Soak".

CF-100, WORLD FLIGHT RECORD—*the 2100 miles from Vancouver to North Bay was recently flown non-stop by a CF-100 in 3 hours, 50 minutes at 550 M.P.H. Piloted by F/L M. Kobierski with F/L D. Turner, Navigator, this was one of many tests performed by the CF-100's of 445 All Weather Squadron, R.C.A.F., Uplands, Ontario. It is the longest non-stop flight completed by a fighter aircraft.*

Ground Crew enjoys heat from quick starting ORENDAS

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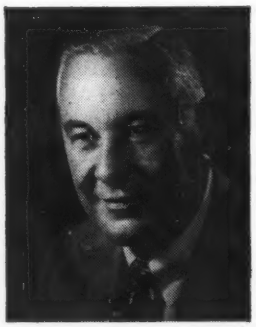

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Where the Gang gets together

RETREADS: A reunion of all Retreads (Veterans of both World Wars I and II) will be held in Washington, D. C., Aug. 27, 28 and 29, 1954. For details contact *Ross H. Currier, 108 Massachusetts Ave., Boston 15, Mass.*

D-DAY ANNIVERSARY: In recognition of the 10th Anniversary of D-Day in Europe, the American Library Service is cooperating with the Library of the United States Military Academy in assembling all available histories of the units that were engaged in any way in that event. Any books, magazines, documents, pictures, etc., that would yield information would be greatly appreciated.

We are also interested in espionage, secret service, cryptography and related fields from the beginning of World War I to date. A collection of material is being assembled to be placed in the library of a leading university for study and research. Correspondence, suggestions, and offerings are invited. *Ray Gould, Director, American Library Service, 117 W. 48th Street, New York 36, N. Y.*

DESTROYED BOOK: My copy of "The German Air Force," by Asher Lee, was destroyed in an accident. Can anyone tell me where I can obtain a replacement copy? *Robert Esposito, 1505 Porter St., Philadelphia 45, Penna.*

CBI VETS: Eight years ago an ex-GI started publishing a news sheet for former members of his old outfit. Today it has grown into a slick-page magazine that keeps alive wartime friendships of vets of the China-Burma-India theater of operations. Editor Clarence Gordon reports that "Ex-CBI Roundup" magazine now runs from 32 to 48 pages, is published monthly, and has a circulation of over 7,000. A free sample copy is available to any CBI vet by writing *Ex-CBI Roundup, Postal Box 1769, Denver 1, Colo.*

305TH BOMB GRP., 8TH AF: The names and addresses of former members of the 305th Bomb Grp., 8th AF, stationed at Chelverston, England, during WW II are needed to advise them of a group history being published soon. The book will be about 400 pages, with over 500 photos of personnel and events, aerial

(Continued on following page)

To be sure your Rendezvous item appears in the August issue, we should have your request by June 15.—THE EDITORS.

That's what the Tech Sergeant wrote after inspecting this Servomechanisms, Inc. electronic computer that came out of a wrecked fighter in Korea.

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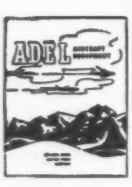

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RENDEZVOUS——CONTINUED

and ground. A narrative history will cover operations of the group. Information and historical material considered classified until now will be included. Support of *all* former members is needed to complete the project and all are asked to send in their present address and former affiliation with the group. Publication will be limited and only those who reply in advance can be sure of receiving a copy. Write: *Bernard L. Thompson, Ltd., 120 W. 42nd St., New York 36, N. Y.*

WHERE ARE THEY?: I'm trying to locate the following friends. Can anyone help me? S/Sgt. Donald E. Kreiger, formerly with 7350th Base Compliment Sqdn., APO 742, New York, N. Y.; S/Sgt. Jack Alborn, formerly with 31st Fighter-Interceptor Wing, Turner AFB, Ga.; and 1st Lt. Mabel Strube, AFNC, formerly stationed at Elmendorf Field, Alaska. *Walter L. Mock, Jr., 5523 Lexington Ave., Apt. 105, Hollywood 38, Calif.*

23RD FIGHTER GROUP: I have a unit history of the 23rd Fighter Group, in China during World War II, well along, but have been stymied for lack of photos of many of the personnel. Would former members of the outfit please contact me? *Alfred Cellier, 316½ 91st St., San Antonio 4, Tex.*

325 CHECKERTAIL CLAN REUNION: The 12th anniversary reunion of the 325 Checkertail Clan will be held July 30 through Aug. 1, Hotel Statler, Cleveland, Ohio. *Contact Co-Chairman Leland N. Castor, 421 East 222d Street, Cleveland 23, Ohio.*

RICH FIELD VETS: The Rich Field, Waco, Texas, WWI Veterans Association will hold their reunion on July 23 and 24 at the Sheraton-Gibson Hotel, Cincinnati, Ohio. Write to *William E. Beigel, 312 Northcrest Dr., Kansas City 16, Mo.*

5TH AIR FORCE SONG: In the Pacific I remember hearing a recorded song about the 5th Air Force. Does anyone have any idea where I could get this recording or the sheet music for the song? *James A. Horkan, 100 Seward, B-3, Detroit 2, Mich.*

THE OLD CREW: I am trying to locate the members of my old combat crew. Anyone know the whereabouts of these fellas? Lts. Ray S. Smith, Eugene E. Twarog, Albert M. Hardie, Jesse L. Field, Karl Funk, Jack Burnley, John Wahlgren; Sgts. Vernon Taylor, Kenneth Snapp, Paul Bowling, Robert Clayton, Jr., Stanley Gault and Harry Lishman. *F. L. (Rats) Ratcliffe, Jr., 1st Lt., AFR, Box 302, Cheney, Wash.*

BANQUET PHOTO: I am trying to locate a photo of the 1951 Airpower Banquet at Los Angeles. The pix was snapped opposite the entrance to the Grove. *Marvin A. Geiger, South Amana, Iowa.*

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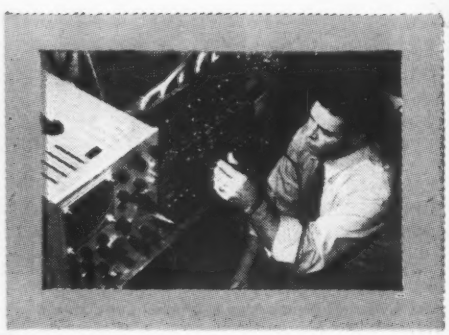

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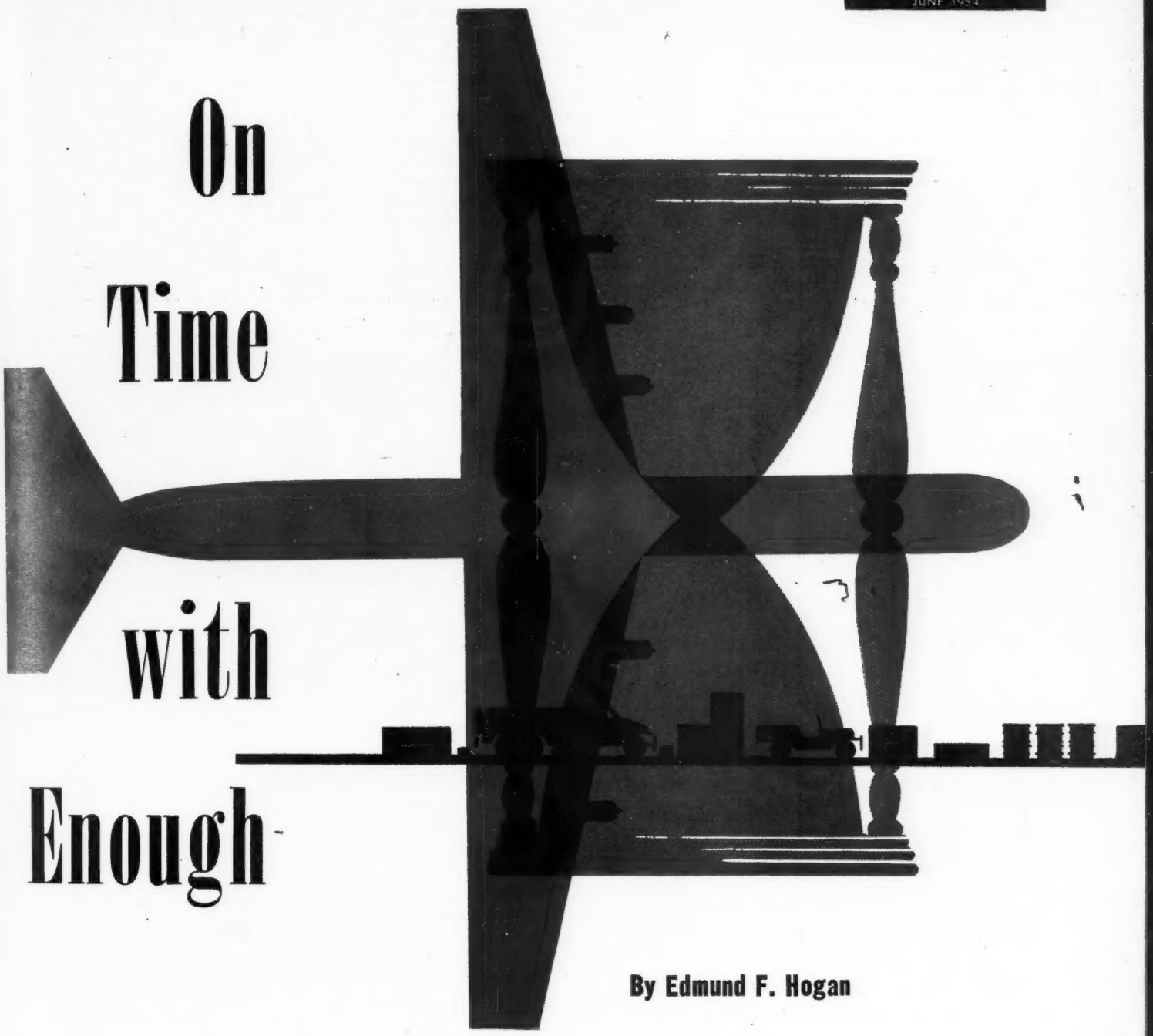
On Time with Enough



By Edmund F. Hogan

As a weapon the airplane has been used with boldness and imagination. Air logistics requires the same kind of thinking

THE AMERICAN language has become the richer for wonderful catch phrases which tell a complete story in a few words and capture the imagination in the process. Nathan Bedford Forrest's "Fust With the Most" has not lost its luster since the testy Confederate general first explained his formula for success in war. "Too little and too late" summed up the stark tragedy of the fall of the Philippines in 1942.

Not long ago a group of Air Force officers considered future logistics objectives and, remembering these catch phrases, suggested one that would sum up the goal rather neatly. It was: "On Time With Enough."

Logistics is that branch of the military art which embraces details of the transport and supply of troops. In its most elemental state it means simply getting to the user the item he needs from the chap who has it.

(Continued on following page)

This doesn't seem so complicated, at first glance. It sounds like logistics is as simple as buying a pack of cigarettes over the counter. The two basic elements of logistics are present in this transaction. The man who smokes is the user. He goes to the supplier—the man who has what he wants, in this case cigarettes. The purchase is made and the logistics cycle is completed.

But military logistics, because of the vast number of persons and kinds of items involved, does not work so easily. It is an art encumbered by countless requisitions, warehouses, depots, contracts, procurement, trains, ships, trucks, seemingly *ad infinitum*.

While development of high-speed aircraft and rapid communications has moved forward rapidly in the last quarter-century, the art of military logistics has hardly begun to keep pace. The following story illustrates the point.

In 1776 citizen-soldiers of Portsmouth, N. H., needed an emergency shipment of gunpowder. They sent a horseman with a requisition to Boston where Gen. Artemus Ward supplied the gunpowder. The rider took a day to cover the fifty-seven miles from Portsmouth to Boston and two and one-half more days were required to haul the gunpowder in wagons from Boston to Portsmouth. The average speed at which the gunpowder moved to the men who needed it, after they first sent out their call, was about one and one-third miles per hour.

In the last days of World War II an average of 106 days was required for an item to reach a combat commander in Germany after he had asked for it. The average speed from the time of requisition to delivery of the requested item was three and one-half miles per hour.

The conclusion is obvious. In 175 years we have developed radio, television, and airplanes that fly faster than the speed of sound. In the same period of time we have increased the speed of getting supplies to the man who needs them by *two miles per hour*.

It is difficult to reconcile the fact that the Air Force, the most mobile of all services, can deliver its firepower at the rate of 600-miles-per-hour and yet has geared the delivery of that self-same firepower to a supply system that moves at the snail-like pace of three and one-half miles per hour.

When supplies move this slowly some procedure must be worked out to assure that the man who needs something will get it. In World War II this procedure took the form of enormous stockpiles. Kwajalein is often recalled as a horrible example of what can happen when this technique is carried to the ultimate. This island was loaded with equipment that might have been needed. The war ended, and for a long time after the tanks, jeeps, bulldozers, *et al*, were pushed into the blue Pacific to get rid of them.

Huge stockpiles are an extravagant way to meet contingencies. We used to call them "contingency stocks." However, even they do not necessarily ensure that you have what you need, where you need it, when you need it.

There are many persons in and out of the Air Force who believe that hundreds of millions of dollars can be saved by substituting airlift for the stockpile. Along with the dollar savings, they say, will be savings in our most critical resource—manpower. And finally, these men insist, items of supply and equipment will move to the user at the pace of a hare rather than that of a tortoise.

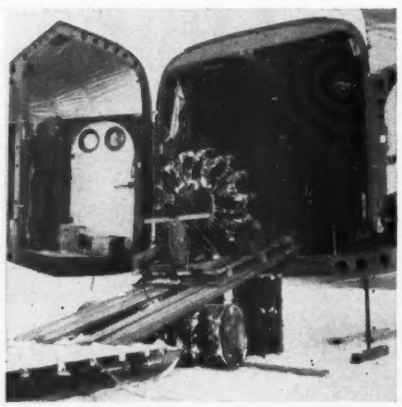
As an example, necessity has dictated that Northeast Air Command place great dependence upon airlift to carry out its two-fold mission of supporting Allied air operations in the northeast and defending the northeast air approaches to the United States and Canada.

Any polar projection of the north points up the truism that NEAC is one of the foremost strategic areas of the Western Hemisphere. It contains the portion of the Western Hemisphere closest to Europe and Western Russia; it lies on the air route which Russia could use to great advantage in striking at Canada and the US; it is on the direct air and sea routes between northeast United States and the most economically-advanced part of Eurasia; it is an unexcelled vantage point from which to study air mass movement and to forecast weather which affects military operations in the North Atlantic and Western Europe.

NEAC is a command of vast distances. Between the headquarters at Pepperrell Air Force Base at St. John's, Newfoundland, and Bluie West 1 in Greenland are 850 over-water nautical miles. Between Goose Bay, Labrador, and Thule, the base at the "top of the world," are some 1,400 nautical miles. A network of weather, navigation, and communications sites tie the main bases together.

In this rugged, primitive land of the Far North, there is a single narrow-gauge railroad, between St. John's on the east coast and Newfoundland and Stephensville on the west. Beyond Newfoundland there are a few roads and sea lanes which provide the only means of point-to-point surface transportation. But surface shipping is limited since many of the ports are closed by ice from five to ten months each year.

Minus rail lines, roads, and open ports, airlift has had to become the life line of this command. Having



Airlift works at Northeast Air Command. Here an engine is unloaded.

seen it work, the people in NEAC are outspokenly pro-airlift.

They will tell you, for example, about the time last winter when a Caterpillar generator which supplies the power for temperature control storage went out at Bluie West 8, the base thirty miles north of the Arctic Circle on Greenland's west coast, ninety-two miles inside the Sondrestrom Fjord. An officer hand-carried an emergency requisition through Air Materiel Command's Transportation Control Depot at Newark, N. J., to the generator manufacturer in Peoria, Ill. Four days after the 29,000-pound generator was put together at the factory, it was installed and running at the base.

Or they will tell you about the incident involving Bluie West 3, a weather station sixty miles from Bluie West 1, last Christmas Eve. The temperature had not risen above zero for three months and a steam-heated water line burst. There was an immediate need to procure an electrically-heated cable to cover 1,600 feet of the water line, plus transformers and insulation. A priority message was sent to Newark and the equipment was located in Connecticut. It was trucked to Westover Air Force Base in Massachu-

setts. One day after the equipment was received at Westover, it was installed at the base.

Or they will tell you about the time last year when a number of water trucks broke down at Thule. And water is a serious problem at these northern bases. It must be trucked from lakes in heated trucks and delivered to the individual buildings where it is to be drunk, cooked with, or washed in.

Without water, operations at Thule would come to a standstill. In this emergency seven 1,000-gallon water trucks were airlifted by Douglas C-124s from the States and normal operations were resumed.

at least one trip a week to each "end site," carrying such things as medical supplies, perishable foods, and electronic spares. And they find time to handle emergencies such as the time a 2,200-pound radar dome was needed at a site in Newfoundland to replace an antenna that had been blown away in 125-mile-per-hour winds.

Not everyone is familiar with the command's dependence on airlift. At NEAC headquarters the story is told of the time a requisition went in asking for telephone poles in order to set up a communications system at BW 8.

The requisition was rejected and someone in the supply cycle, not knowing that the highest bush north of the Arctic Circle probably doesn't exceed three feet, directed they be purchased locally.

The word went back from NEAC that the poles could not be bought in the vicinity of the base. The answer to this one was a directive to buy the poles at BW 1 and ship them the 450 miles by rail to BW 8.

NEAC finally got over the point that the only railroad was hundreds of miles to the south, in Newfoundland, and that the poles were needed via airlift from the States.

Opponents of airlift as a substitute for stockpiling say the airplane cannot haul a large enough payload to make it worthwhile. Yet the C-124, on a run from Westover to Thule, can carry a payload of fifteen tons, and last year had no trouble airlifting such bulky items as snow plows and heavy construction equipment.

The airlift system is not foolproof. A C-124, caught in high winds blowing from the ice cap adjacent to Thule on March 9, was still out of commission on May 1 for want of an elevator hinge. And a C-47 was on the sidelines four weeks for lack of a common plug for a prop-feathering motor. These incidents point out the need of modernizing paper work and slashing red tape so that the speed of airlift can be fully used to get parts in a matter of hours.

But such shortcomings do not detract from the fact that airlift is the key to NEAC's operations. "We couldn't live without it," is the way the commander, Lt. Gen. Charles T. Myers, expresses his belief in the principle. But there is always room for improvement. For example, one base commander still wonders why it takes six months to get an item he can procure from Sears and Roebuck in ten days by mail order.

With the approval of Headquarters USAF, NEAC has taken a major step forward toward breaking bottlenecks which slow up requisition-filling.

At present, bases in Newfoundland send requisitions direct to the Newark Transportation Control Depot. On July 1, the northern bases, too, will follow this procedure. This eliminates one middleman in the form of NEAC heaquarters. Under the previous system, the bases sent their requisitions to NEAC where they were screened, monitored, reviewed, and then forwarded to Newark for processing.

Since Newark merely processes paper and sends the requisitions to a materiel depot for filling, this suggests the possibility that the bases some day will be permitted to go direct to the depot with their requests. Such a procedure would knock out another middleman and get one step closer to the ultimate goal, permitting the man who wants an item to go direct to the man who has it.

There are five principal reasons why there is so much delay in getting items to the place they are needed. The first is the statement of

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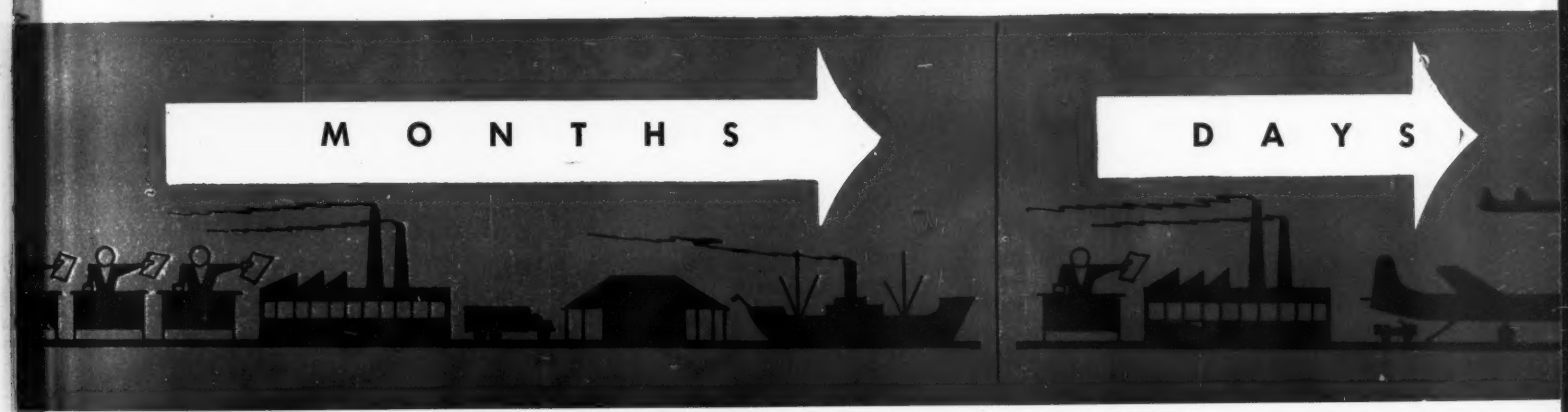


The present system of logistics—with its reams of paperwork, stockpiles, warehouses, and reliance on slow surface transportation—leads to a supply pipeline involving months to get men and materials to where they are needed.

By slashing red tape to the bone and substituting airlift, this logistics can be streamlined to a matter of days.

NEAC's airlift is carried out principally by MATS and by its own 6614th Air Transport Group. Supplies and equipment are gathered at Westover and hauled by MATS into the theater. MATS schedules runs into virtually all of the bases, and the main supply of the so-called "end sites"—radar, weather, and communications sites located in isolated areas—is handled by NEAC's transport group.

This group has a squadron of Douglas C-54s at Pepperrell, a squadron of Fairchild C-119s at Ernest Harmon Air Base at Stephensville, and a squadron at Goose Bay, which keeps seven "end sites" alive with a variety of equipment including helicopters and Grumman SA-16s.

In March alone, the Goose Bay squadron moved 109,000 pounds of cargo, including mail and passengers, into the seven locations. In April the squadron jumped this total to 167,000 pounds. These operations sometimes involve the use of two aircraft, a Douglas C-47 and a helicopter. The C-47 will land on the ice nearest the site, then the load will be transferred to a 'copter for final delivery.

The Goose Bay squadron schedules

requirement. This is followed by the actual requisitioning, in which the paper passes from one hand to another. Next comes the transportation of the goods. Then there is transient storage in warehouses and, finally, actual issue.

All of these steps eat up time, and for this reason NEAC and USAF have agreed upon a procedure which at least gets the paper work to the US a little faster.

One of the keys to a successful aerial logistics operation is the airplane itself. Numerous studies have been conducted in this field, all aimed at producing the kind or kinds of aircraft which will carry the greatest payloads, the farthest distances, in the fastest time.

A Research and Development (RAND) study just completed for the Air Force made these general conclusions regarding possible future transport aircraft:

- The cruising speed at which lowest operating cost per ton-mile is achieved depends upon the type of engine powering the aircraft, but is independent of payload and range. This speed is least with the compound-reciprocating engines and greatest with turbojet engines.
- Airplanes powered by turboprop engines provide lower direct operating cost per ton-mile than do airplanes powered by compound-reciprocating or turbojet engines for any combination of design speed, payload, and range considered.
- Large airplanes (resulting from long-range and large payload design) have lower direct operating cost per ton-mile than do small airplanes. The large airplanes are also less sensitive to variation in operating range both from the standpoint of cost per ton-mile and airlift capacity.
- Selection of a preferred aircraft should be based upon the cost to perform the total logistics job by a fleet of the airplanes rather than upon the ability of one airplane to fulfill some single payload-range requirement.
- The cost of air transportation can be considerably lower in the future than it is today if a well-integrated plan for airplanes and engine development is aggressively pursued.

The RAND study considered designs capable of payloads up to 150,000 pounds, with a range of from 1,500 to 3,000 nautical miles, with cruising speeds from 180 to 490 knots, and requiring runway lengths of anywhere from 2,000 to 6,000 feet.

This RAND study did not recommend the transport of the future. It merely assessed certain designs and discussed these with the Air Force and manufacturing companies. It was, in fact, an idea workshop for the design of the air transport of the future.

Meanwhile, the present Air Force logistics system is built around minimum stock levels on hand. Most NEAC installations, for example, because of the brief shipping season, must stock 360-day levels of supply, except for critical and high-cost items. These latter, which consist primarily of electronics spares, perishables, and aircraft parts, are authorized to be stocked at a 120-day level. Basic to this kind of operation is the assumption that the use of spare parts is regular and stable. This assumption is not always correct, for demand is erratic and no stock level except a very high one is useful if the parts are to be always available when needed.

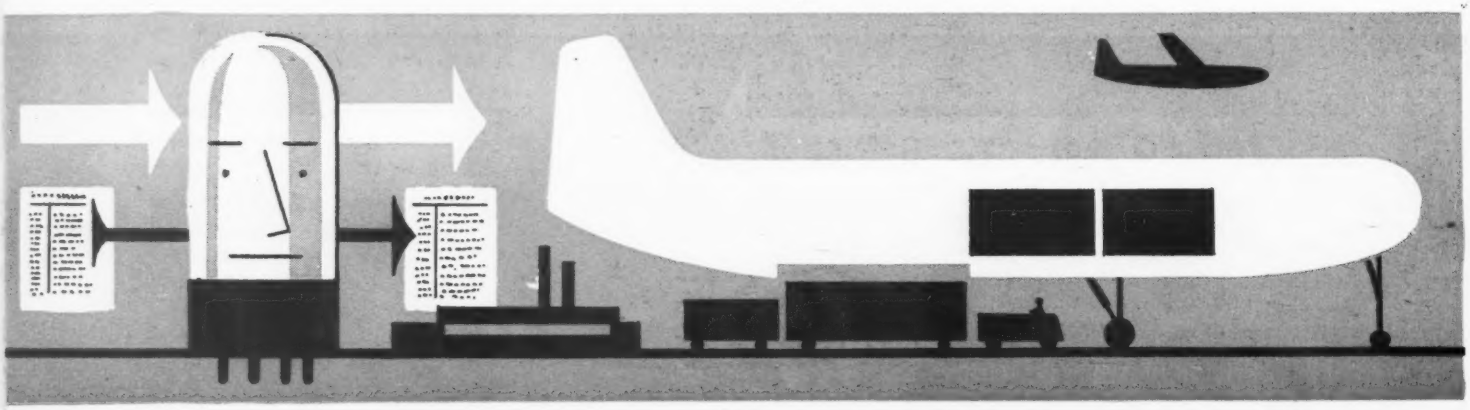
Stock levels can be translated into simple terms. For instance, there are about 100,000 line items of supply in stock at Goose Bay. About 45,000 of these represent aircraft and electronics spares which are airlifted the year round. These spares alone require 100,000 square feet of covered storage. One warehouse alone for back-up spares on automotive maintenance runs to 40,000 square feet. The price tag on goods stored at Goose is $38,000,000.

The 360-day level of supply, in the opinion of most NEAC officials, generates excesses. One supply officer said, "There's no way you can forecast a year's supply accurately. If we could cut this level to ninety or 120 days, the margin for error would be reduced." The obvious way to cut it is, of course, more airlift. Then they wouldn't have to worry about the short over-water shipping season.

Construction costs at Goose are two and one-half times and, at Thule, three and one-half times those in the States. Greater airlift would reduce the need for expensive warehouses. But the kind of airlift that would be required to satisfy the needs of these northern bases just doesn't exist at the present time.

This summer, in two months, Thule will receive 93,000 tons of supplies from ships. At the present time it is restricted to an authorization of twenty-nine C-124 trips and sixty-one C-54 trips per month. This represents an airlift of about 625 tons per month, including passenger traffic. The airlift would have to be increased more than ten-fold merely to equal the water-borne lift.

The present system, it must be said, breeds excess inventories, and losses through obsolescence are always possible. Perhaps twenty per-



Basic to the concept of air logistics is a system of speedy handling of requisitions, perhaps with the aid of electronic memory devices; improved packaging and cargo handling procedures; elimination of middlemen, stockpiles, and warehouses; and the development of speedy, efficient cargo aircraft specifically designed for military logistics.

cent of the total Air Force investment in stock can be lost through obsolescence and surplus which means a specific figure of $800,000,000 annually now.

Col. Henry S. Monroe, Deputy for Materiel at NEAC, sees more emphasis on airlift helping "reduce the number of line items of supply which are now required." It may be, he says, that a base will have no need to carry more than 60,000 line items, instead of the more than 100,000 of the present. Inventory control, he believes, will be helped because "if a person knows he can get fast supply action by air, he won't be inclined to carry large stocks in inventory."

In this he is echoed by Col. Richard H. Henderson, his assistant for logistics plans. "Without fast supply action," he says, "any man is tempted to order three times as much as he needs. But so long as he knows he can get what he needs in a hurry, he will keep his estimates down to a reasonable figure."

The present system of stockpiling at bases is rooted in the substantial time required to get the item from the man who has it to the man who needs it. This is the nub of the problem.

One factor that adds to the delay is the amount of paper work required, and some who have pondered how to speed the flow of supplies believe that use of electronic memory devices will help. These devices, they say, will eliminate manual handling of data and cut information flow time appreciably. Regardless of distance, these machines could transmit a requisition from a base to the source of supply in a matter of seconds.

But even if every base and every depot were equipped with an electronic memory device that would virtually eliminate paper work, there still would remain the problem of moving the material rapidly.

The present system of logistics regards air as a medium for emergency shipments, rather than as a normal means of transportation.

Although NEAC is an exception to this rule, the record indicates that most people do think of airlift in terms of crash operations such as "Operations Vittles," which supplied Berlin entirely by air, and the Pacific Airlift to Korea.

The fact that the airplane has been used largely for priority handling to plug gaps has led to wide misunderstanding of the economics of airlift. It has been unjustly tagged as a high-cost, blue-ribbon method of moving supplies, economical only in an emergency.

Sometimes it takes longer to find a part than it did to procure it. The streamlined, revolving storage bins (right) should help in this regard.

Airlift, too, is presently tied to surface transportation. For example, an item scheduled to be airlifted to NEAC on other than an emergency basis, will go to Westover by truck or by rail to be placed aboard an airplane. It is not unusual for an item to spend a week in transit between a depot and Westover.

Air Materiel Command recently announced a program aimed at cutting this delay and speeding the delivery of supplies. In the process, AMC believes transportation costs will be shaved.

The system is called "Mercury Service" and involves an airlift provided by civilian carriers under contract, which will connect Air Force Depots and ports of aerial embarkation in the US.

The service was established after a year's study and parallels much thinking that overseas airlift should be tied to domestic airlift, if supplies are to be moved more rapidly.

AMC's service spans the nation, forming the nucleus of a flexible system which could be the stepping-stone to the kind of rapid logistics movement many planners believe possible.

Overseas extension of the "Mercury Service" idea is already in the talking stage. The Department of Defense and British aviation officials are beginning to talk in terms of a transoceanic merchant marine of the air.

Not long ago Defense officials told the Civil Aeronautics Board that they do not consider the present overseas service provided by US carriers adequate to meet future military requirements. At the present time two US airlines operate scheduled air freight service across the Atlantic in aircraft devoted exclusively to cargo.

Recently, however, a large British independent, Airwork, Ltd., was approved as a transatlantic all-cargo carrier by both the British and US Governments. Only last April, Transport Air Group, Inc., the US association of airlift and airfreight carriers, asked CAB to permit its member carriers to operate across the Atlantic and Pacific.

This request was accompanied by a recitation of the record which shows that in 1946 some 40,000,000 ton miles of air freight were carried domestically. In 1952, this had increased to 242,000,000 ton miles, a six-fold increase in six years.

This kind of record fires the imagination of those who see the airplane as the instrument for bringing about high-speed flow of materiel on a practical economic basis.

There is, for example, a study in the Pentagon which states that we currently require more than 200 days of supply in our world-wide pipeline to insure one day's supply to units in the field. Direct costs of airlift may be higher than surface carrier but there are savings in indirect costs to offset them. For example, any dent made in this 200-day supply pipeline should result in savings, all the way back, and including procurement itself.

On a unit basis, the cost of a high-speed aerial logistics system will be higher initially than the present system because a closer time schedule must be arranged. Some days aircraft will not carry full loads, and there will be a number of small lot shipments to individual bases.

But there would be some benefits to offset these factors. Improved packaging would result in a saving in weight. Airlift does not require heavy, protective packaging. This means more payload can be placed into each airplane.

In connection with packaging, Gen. Edwin W. Rawlings told the Air War College last year that almost eight percent of AMC's procurement

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dollars—some $743 million in Fiscal Year 1952—must be allocated to protective packaging.

In addition to savings in packaging, the need for back-hauling and cross-hauling would be reduced, since most of the tonnage would be delivered for immediate use rather than for stockage in a warehouse.

There would be a further saving in that items would require less warehousing, inventorying, and labeling in the route from the manufacturer to the using units.

And since logistics involves the movement of people as well as materiel, great savings could be anticipated in personnel transportation costs.

Some logistics planners estimate that about $50 million could be saved yearly simply by maximum use of the airlift presently available. With improved personnel carriers, they believe greater savings could be anticipated.

This is brought home with greater impact by a situation which occurred in NEAC last year.

Construction, like shipping, is seasonal at the northern bases in that command. Last year an aviation engineer battalion was sent on temporary duty to the base at Frobisher Bay for a construction project.

The battalion of 400 men traveled by ship which was scheduled to dock about July 1. The ice, however, was packed so tightly that the ship could not off-load until early in August. Not only did Air Force lose the services of these men while they waited in the open water of Baffin's Bay, but it had to pick up the per diem costs for them for a month.

On the other hand, at Thule, highly-skilled construction workers were flown in to be on hand when their services were required, and then airlifted out. Use of the airplane effected a large saving in construction costs in this area alone. Had highly-skilled electricians, for example, been required to sit around and wait for the construction to advance to a stage requiring their services, the expense of maintaining them in idleness would have been extremely high.

As it stands, Thule represents an investment of at least $300 million. Without airlift, the cost would have been appreciably higher. And minus airlift, which hauled in tons of equipment for contractors and engineers, construction could not have been completed in the very brief time available.

At this stage in the development of airlift it is not suggested that fuel, building materials, ammunition, and similar commodities can be airlifted in quantity to compare with surface transportation. But once these items are eliminated, the tonnage required by bases becomes comparatively small. Lower stock levels will mean fewer expensive warehouses, fewer people required to sort, bin, and identify, and these savings could be used to help pay the cost of developing the aerial transports which will be needed to make the concept work.

Last year, Strategic Air Command conducted an operation involving aerial resupply of aircraft and electronics spare parts and engines from the United States to a medium bomb wing in England, operating under simulated combat conditions for ninety days. The objective was to acquire data on logistics.

At the time, 150 days were required for the pipeline time to a depot in Europe. A ninety-day supply level was maintained in the depots, another fifteen days of pipeline time were required from the depots to the bases, and the bases maintained a thirty-day level. This totaled 285 days of supply in the pineline to give a unit in Europe a thirty-day operating stock level.

SAC was able to get seventy-four percent of all items requisitioned delivered to a port of aerial embarkation in the States within ten days. Eighty-three percent of the total requisitions were delivered within twenty days. An additional three days were required to process the materiel and deliver it to the units. At the very least, SAC's operation was able to cut 262 days from the supply pipeline time.

It is true that the test unit was well trained, that its requisitions had high priority, and that it had special management. But it also proved that airlift procedures are workable, if given a chance to succeed.

One of the world's recognized experts in aerial logistics, Lt. Gen. William H. Tunner, has said that "no longer should we consider air transport only as a solution for emergencies resulting from international political crises or military requirements such as shortages of supply or rush delivery of high-cost items."

Writing in the *Air University Quarterly Review*, General Tunner called for an end to huge stockpiles and long pipelines. "The theory of an abundance of supply, stockpiled on all fronts," he said, "no longer is tolerable. We simply cannot stockpile supplies all over the world in anticipation of emergencies which may arise."

General Tunner called attention to the fact that frontiers of battle are no longer restricted to definite limits and that stockpiles in a given area are worthless when the attack occurs halfway around the world from the stockpile.

"It may be said," he argued, "that with the reduction of stockpiles, and with the flow from factory to front by air transport, the industrial potential of the nation can be expanded by the amount of man hours and other production factors which will have gone into stockpiles."

Many military man-hours are wasted in moving men from base to base. General Tunner is among those who believe that effective air transport would reduce the number of persons in actual travel status by seventy-five percent. But he also sees the airplane, with its high mobility, as the vehicle capable of massing our armies where and when we choose in time of war.

America's industrial production, plus its trained people, General Tunner said, "is equal to any hostile combination if we can bring it into play at the time we want it, where we want it, and in the manner we choose to employ it."

However, he added, "only the proper use of mass air transport can assure that this, our most valuable asset, will be effective enough to tip the scales in our favor."

The alternative to the principles espoused by men like General Tunner is continued investment of large sums in vast installations with their attendant high-dollar inventories. It was this kind of investment that touched off the attack on Air Force overseas bases by Senators Russell Long and Wayne Morse about a year ago.

A great many persons in the Pentagon took exception to the statements of waste expressed by the Senators, but the fact is that they hit upon a subject dear to the heart of the American taxpayer—his pocketbook.

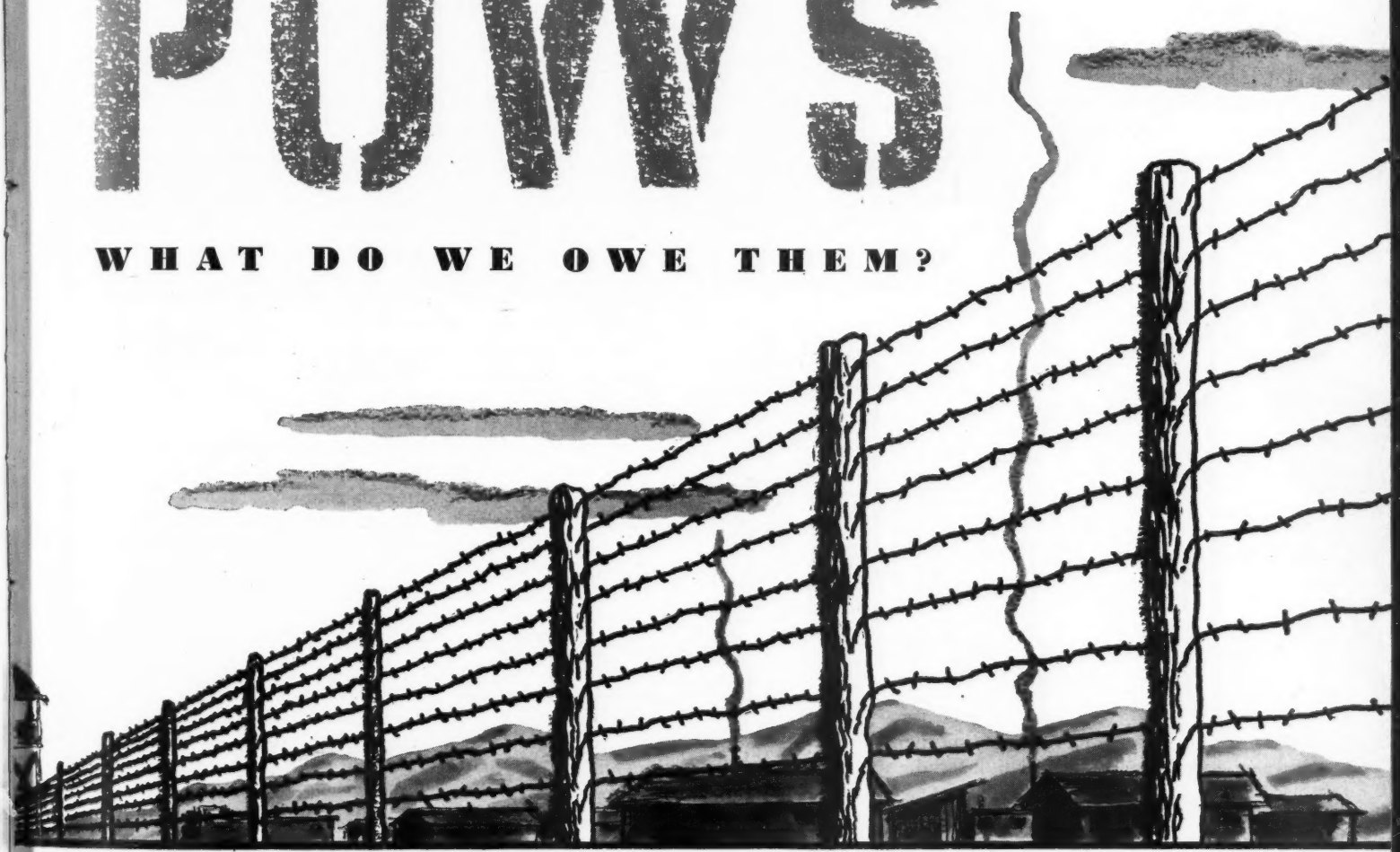
"We are simply saying to the armed services," the Senators said in defense of their position, "that if their present planning calls for these vast outlays of dollars and men over a considerable period of time, then to that extent their plan is seriously, perhaps tragically defective."

The taxpayer will not soon forget those tales he heard of the great mounds of crates on Guam and Italy in the last war. To find out what was

(Continued on page 50)

POWs

WHAT DO WE OWE THEM?



By John F. Loosbrock

LAST November, in discussing the cases of Air Force prisoners of war who had made false "confessions" of participation in bacteriological warfare, we cautioned that it was then "far too early to assess individual cases or to single out persons for either praise or blame."

"That," we wrote, "is a job for the official investigators and one which they must approach with open minds, with wisdom, with sympathy, and with justice."

These words were written four months before the Air Force established a special board of general officers to review the cases of eighty-three officers and airmen who either made false "confessions" or who were accused of collaboration with their captors in other ways. Last month the results of the board's deliberations were made public and, we are happy to report, the findings indicate that its members did indeed approach the problem "with open minds, with wisdom, with sympathy, and with justice."

For, after hearing testimony from such experts as Dr. Charles W. Mayo, famous physician, and Dr. Joost M. Merloo, a Columbia University psychiatrist and former member of the Dutch anti-Nazi underground, the board pored over case histories for five weeks. Its recommendations were:

- That none of the eighty-three men investigated be tried by court-martial.
- That fourteen of the eighty-three be required to show cause why they should be retained in the service, giving them in effect the option of an honorable discharge, resignation, or retirement, as the case may be, without jeopardizing any benefits that might accrue to them as veterans.
- That the cases of the other sixty-nine be closed without any possible prejudice to their careers in terms of future assignments, promotion, or any other factors.

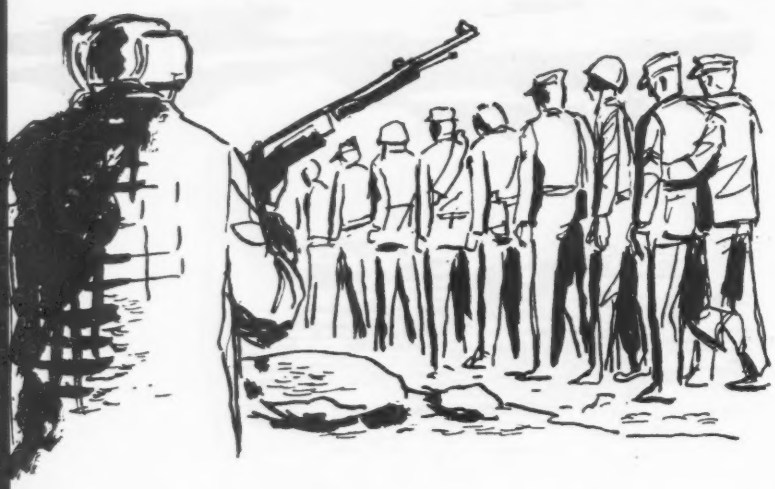
(Continued on following page)

It would appear that the Air Force has handled a delicate problem honorably and equitably.

For, as AFA President George C. Kenney pointed out in his editorial in the November 1953 issue of AIR FORCE, these cases had to be "evaluated in terms of sympathetic appreciation of the mental and physical condition of American fighting men worn down by months of forced exhaustion, unbelievable living conditions, solitary confinement, continuous interrogation, ingenious methods of mental torture and, in some cases, brutal physical torture, all of which play tricks with the senses and the nervous system."

On this score the board reported, in its official findings, that "the unhuman treatment to which our POWs were subjected has been well-documented and publicized. The board . . . took into consideration the nature, degree, and duration of duress in each individual case."

General Kenney's editorial further stated that our airmen in Korea were not adequately trained in psychological warfare, that "we have not taught them how to deal with the technique underlying the ludicrous 'germ warfare'



charges of the enemy. Our fighting men still are instructed to give only 'name, rank, and serial number' when captured, as if silence were protection."

Again, the Air Force board reported that "the briefing and indoctrination given our combat personnel as to conduct of prisoners of war was inadequate and confusing. Published policy and directives in this regard were given mixed interpretations at various command levels."

Thus the extenuating circumstances which General Kenney pointed out last fall were taken into full consideration by the board, which was presided over by retired Lt. Gen. Idwal H. Edwards. Other board members included Maj. Gen. Glenn O. Barcus, Maj. Gen. Jarred V. Crabb, Brig. Gen. Monro MacCloskey, and Brig. Gen. Richard H. Carmichael. Significantly, three of the five—Generals Barcus, Crabb, and Carmichael—saw service in Korea and one—Carmichael—had been a POW of the Japanese in World War II.

General Kenney's editorial also called for recognition of those prisoners "who, despite barbarous treatment, hideous torture, and threats of death, flatly refused to confess to germ warfare or to any other aspect of Communism's Big Lie." Such men, he said, deserve the Congressional Medal of Honor. Actually, the Air Force will decorate some of these men this summer although what specific awards will be made has not been determined.

Perhaps the most far-reaching of the board's recommendations had to do with the sixty-nine who were exonerated completely "without any possible future prejudice for their actions as prisoners of war." For this was in sharp contrast to the action of the Marine Corps, which likewise exonerated Col. Frank H. Schwable for the same kind of offense but clouded his future career with a statement by the Corps' Commandant, Gen. Lemuel C. Shepherd, Jr., to the effect that Colonel Schwable's future assignments would be restricted to "duties of a type making minimum demands . . . upon the elements of unblemished personal example and leadership." Colonel Schwable, therefore, would appear to be in the unfortunate position of having been judged guiltless, then pronounced unreliable.

Another facet of the Air Force's handling of the situation which merits praise is the fact that the board's deliberations were carried on behind closed doors and that, even when its findings were published, no names were named. Again the Air Force deliberations contrasted strongly with the publicity attendant upon the proceedings involving Colonel Schwable and upon the case of Army Cpl. Edward S. Dickenson, whom a court-martial sentenced to ten years' hard labor.

Obviously the problem still remains as knotty as it was when the first phony "confessions" burst on an incredulous America. No firm, across-the-board method of handling it has yet appeared, nor is it likely to so long as the basic question remains unanswered—How do we prepare our airmen, soldiers, and marines for a prison camp ordeal that has no parallel in military history?

Dr. Merloo, the Dutch psychiatrist, writing in *The New York Times*, says there is but one answer:

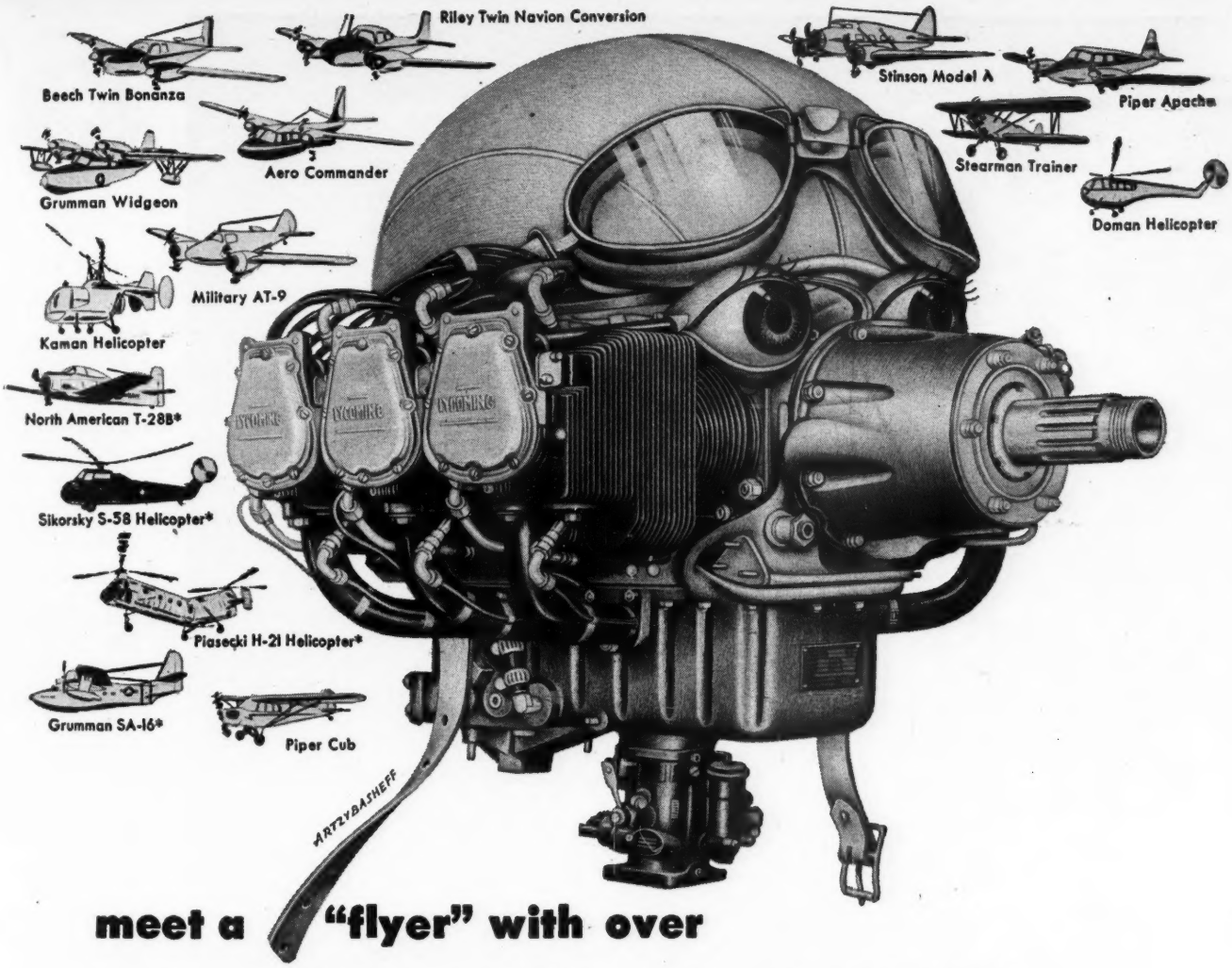
"There is only one form of immunization against the totalitarian attack on human convictions. It is based on a deeply founded belief in democratic freedom and a deep understanding of the steadily evolving system of checks and balances, of laws and rights made to canalize man's drive and hunger for power."

"Liberty and mental freedom," wrote Dr. Merloo, "are no simple ideals we can take for granted, or grasp at in a mood of rebellion. They have to be thought through. Their natural and artificial limitations have to be known. If man is unaware of new mental pressures threatening him in this aftermath of war, he will become an easy and willing victim, howling with the wolves in the woods."

This philosophic approach to the problem would seem to be basic although it, too, leaves unanswered the questions of ways and means and specific techniques of mentally arming our fighting men against the corrosive acids of Communist brainwashing. This, we understand, is being done but so far the wheels have ground quite slowly in turning out a workable anti-brainwashing program. It would appear, in the light of the experiences of Korea, that the highest priority for this kind of research is called for. Such moral and mental indoctrination would appear to be as vital a weapon in democracy's arsenal as the H-bomb or the B-52.

For other Koreas may well be in the offing. Already disturbing reports from Indo-China indicate that Chinese brainwashing teams have been added to military aid flowing into the Viet Minh forces. Undoubtedly, with the capture of the gallant defenders of Dien Bien Phu, more "confessions" will be ground out of the Red propaganda machine. In fact, a mock "trial" is all set to go into gear with Brig. Gen. Christian de Castries, captured French commander of Dien Bien Phu, slated to appear in the prisoner's dock as a "war criminal."

The Communists know a good propaganda weapon when they see it. We, in turn, have an obligation to help our fighting men cope with the brainwashers. This much, at least, we owe to the POWs of Korea.—END



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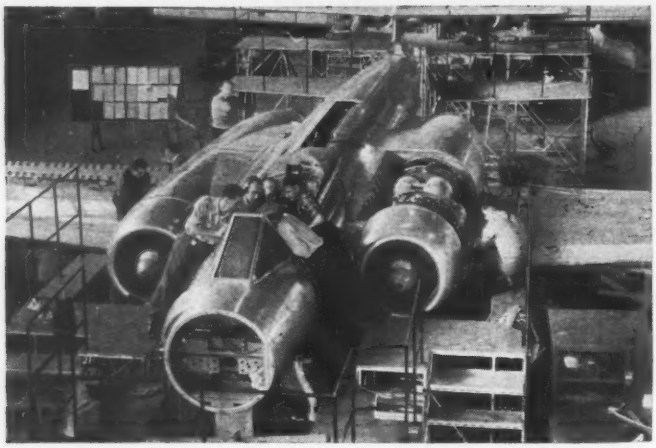
North of the Border

How Does CANADIAN Aviation Stack Up?

Don't sell the RCAF short! After a post-war lull, aviation's booming again in Canada. For the how's and why's, turn the page

By James Hornick

Canadian-built F-86 Sabres (bottom of page) bolster the Free World's arsenal.



Avro Canada production line shows CF-100 twin-jet, all-weather interceptors in advanced stage of production.

In its plant near Toronto, Avro is also building Orenda turbojets that power the CF-100 and Canadian-built F-86s.

CANADIAN AVIATION — CONTINUED

IN LATE 1949, gravely concerned over the trend of world affairs, the Canadian government made a speedy reassessment of its air defenses. It found them woefully lacking.

During World War II, the Royal Canadian Air Force had grown to a strength of 215,000 men and women. It operated forty-seven squadrons in Western Europe, the Mediterranean, Indian and Burmese theaters. Canadian aircraft plants then employed more than 80,000 people, and turned out no less than 16,000 planes, from light trainers to heavy bombers.

But following the armistice, Canada's conversion to peace was thorough, efficient, and almost instantaneous. Scores of RCAF bases were closed. Manpower plunged to less than a tenth of its wartime peak. Fewer than a half dozen full-time squadrons were maintained. Employment in the aircraft industry shrivelled to a meager 8,000. Production was measured in dozens, rather than thousands.

This was the cheerless picture which presented itself in the fall of 1949 to anxious members of Prime Minister Louis St. Laurent's cabinet.

Something had to be done, and done quickly. The darkening clouds over Western Europe, the worsening squall which led to Korea, had caught Canada without an umbrella.

Four years and innumerable crises later, things had changed. Canada had become the third-ranking air power of the Western alliance, surpassed only by the United States and Britain. Canadian-made jets were serving as part of the bulwark in Europe against Soviet aggression from the skies. Canadian plants were producing two first-line jet interceptors, one jet trainer, a piston-engine trainer, two utility transports, two jet engines, and one piston engine.

Not only were domestic requirements being satisfied, but Canada was able to spare substantial numbers of aircraft for export to her allies. To the British Royal Air Force have gone 370 F-86E Sabres; to the USAF have gone sixty more. To the US Army and the USAF have gone, or are going, close to 500 home-designed de Havilland L-20 Beaver liaison aircraft. To the USAF and to Canada's other partners in the North Atlantic Treaty Organization have gone nearly 300 Canadian-built T-6 Texan trainers.

One home-designed, home-built interceptor (the twin-jet Avro CF-100 Canuck) is the most heavily armed (106 2.75 rockets, eight .50 caliber machine guns) aircraft of its type in service with any of the allied air forces, USAF included.

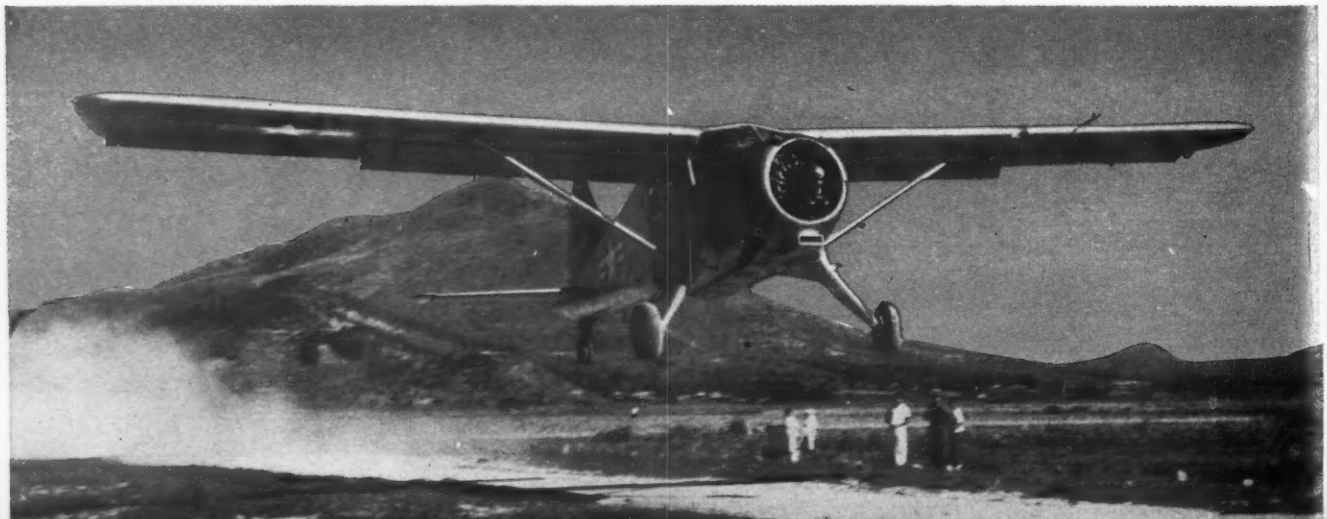
Nearing production is a maritime reconnaissance aircraft which Canadians claim will be a world-beater (twenty-four hours' endurance, Canadian-developed acoustic torpedoes, remote-control cannon, tremendous radar capacity, unparalleled crew comfort).

On the drawing boards are a revolutionary type of vertical take-off jet (widely publicized as Canada's flying saucer), and a long-range delta-wing interceptor in the 1,200-mph class.

All this, remember, without one

(Continued on page 39)

The rugged de Havilland Beaver played an important role in Korean operations. The L-20 demonstrated its ability to land or take-off from almost any flat surface. The USAF and US Army are buying nearly 500 of these planes.



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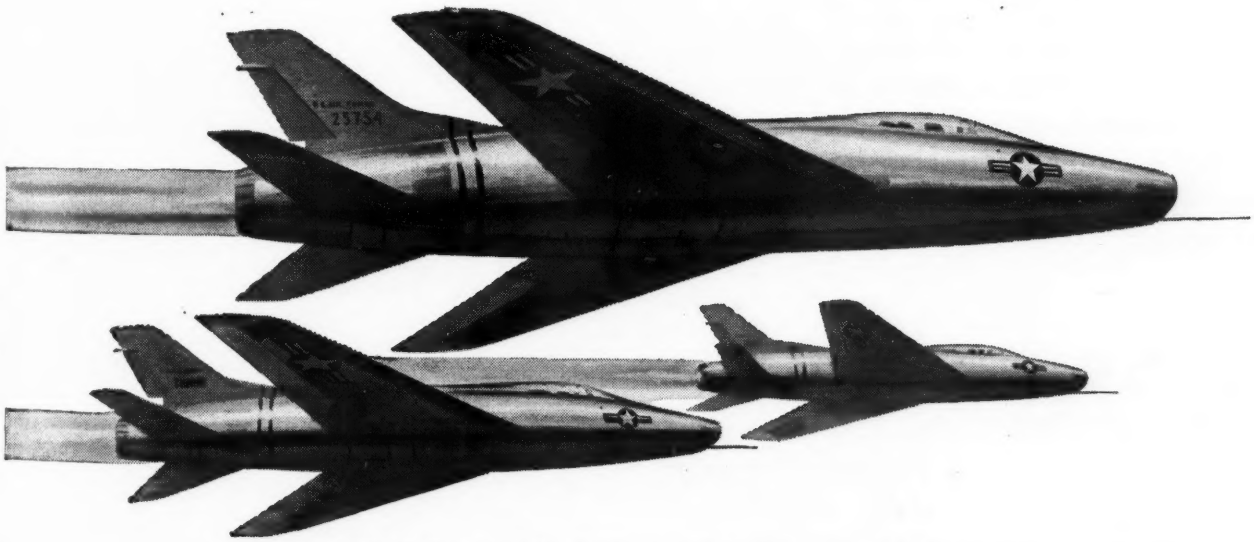

America's first operational supersonic fighter...the F-100 Super Sabre...surpasses Mach 1—the speed of sound—in normal, level flight. Mach, (pronounced "mock"), is the only accurate way of expressing jet plane speeds, because the speed of sound varies with the temperature and the altitude at which a plane is flying. So, a jet flying at Mach 1 is flying at the speed of sound...no matter what altitude or temperature. The sound of these powerful jets overhead is your assurance of security in the skies.

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penny from the generous coffers of the United States government. Canada has insisted, as she did throughout World War II, on paying her own way. Thus, when hard-pressed USAF squadrons in Korea received Canadian-built F-86s, Canada forwarded an invoice covering services rendered. She had, after all, paid generously for the privilege of building Sabres.

Target strength of the Royal Canadian Air Force, due to be reached early next year, is forty-one squadrons—only six squadrons short of her all-out wartime maximum. Thirty-six squadrons are functioning already. Manpower is now 45,000 and may grow to 60,000.

Canada's is a predominantly fighter air force. Bombing is the function of the US and Britain, her more populous partners.

Present planning for the forty-one squadron goal envisions twenty-one permanent fighter squadrons, twelve of them based in Europe; twelve auxiliary squadrons (ten fighter, two tactical bomber); five transport squadrons; and three maritime reconnaissance squadrons. All but five of the projected permanent fighter squadrons have now been formed.

When this ambitious target was set—just four years ago—the RCAF was totally unprepared. Its main strength was concentrated in auxiliary squadrons, similar in organization and function to units of the US Air National Guard.

Canada had discarded the vast majority of her wartime aircraft. Nationalist China had purchased more than 200 Canadian-built de Havilland Mosquito fighter-bombers. Scores of amphibious Cansos (Canada's version of the Consolidated PBY) had gone to the air forces of Sweden, Denmark, some of the South American republics, and to civilian organizations.

Anson, Harvard, Cornell, Tiger Moth, and Fleet trainers, mainstays of the Canadian-administered British Commonwealth Air Training Plan, had been retired from service and sold by the thousands. The only operational aircraft in service was the British-built de Havilland Vampire, a small, cannon-firing jet designed late in World War II. About seventy-five of these machines were purchased by the RCAF. Most were alloted to auxiliary squadrons.

The RCAF was pitifully weak. So was the Canadian aircraft industry. As a stop-gap measure, the RCAF did some hurried shopping abroad. From US surplus stocks she purchased 100 B-25 Mitchell light bombers and 100 F-51 Mustang piston-engine fighters. She borrowed (and subsequently returned or replaced) 100 T-6 Texan trainers. From Beechcraft in the US she ordered some 200 twin-engine Expeditor (C-45) crew trainers.

From domestic stockpiles she pulled all available Harvard trainers (the Canadian-built T-6), Dakotas, (the ubiquitous DC-3-*cum*-C-47), North Stars (a Canadian redesign of the DC-4), British-designed, Canadian-built four-engine Lancaster bombers, Mitchells, and Mustangs.

Licensing agreements were signed and orders went out to Canadian plants for the F-86E Sabre, the Lockheed T-33 Silver Star (modified to carry British-built Rolls Royce Nene engines) and T-6 Harvards. Contracts were awarded for quantity production of the then-new CF-100 all-weather jet and the Orenda engines to power it.

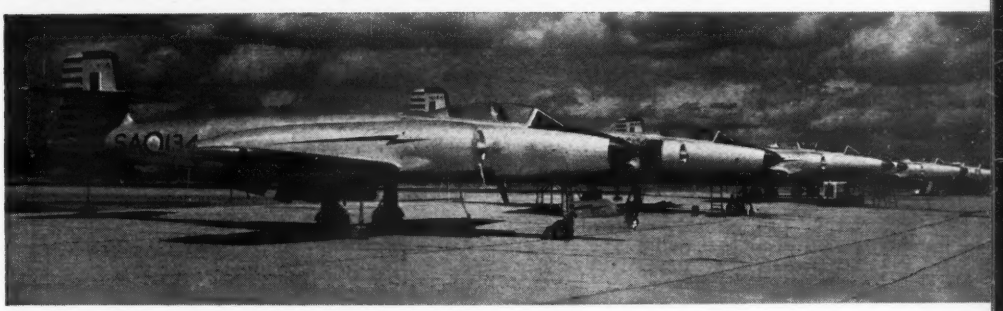
The Royal Canadian Navy conducted a rapid expansion (though on a far smaller scale) of its own. For its sole aircraft carrier, *HMCS Magnificent*, and for shore installations, the RCN arranged purchases from US stores of 150 Grumman Avengers and had them modified to an anti-submarine specification.

Things began to happen.

Defense appropriations swelled to new peacetime highs. Difficulties were encountered. Snags developed. Criticisms multiplied. But Canadian airpower expanded with unprecedented speed. Wartime bases were reopened and, in many cases, almost completely rebuilt. Runways were extended and strengthened. New hangars were built. Housing was provided for personnel. Work began,

(Continued on following page)

A crew of an RCAF North Star transport unloads at Haneda Air Base, Japan, after a Pacific Airlift flight.



US air defense depends in part on CF-100s, guarding northern approaches.

How Canadian flyers did their part in the Korean air war

Little known to most Americans was Canada's contribution to the United Nations' action in Korea. Early in the fighting, the 426th Transport Squadron of the RCAF was assigned to the US Military Air Transport Service and transferred to McChord AFB, Washington.

North Star transports of the renowned Thunderbird Squadron quickly established a record for serviceability which endured throughout its service. In 500 flights the Thunderbirds carried 11,000 passengers and 4,000,000 pounds of freight.

Twenty RCAF pilots served as exchange officers with USAF fighter squadrons. Among them they destroyed eight enemy aircraft, damaged another eight, and scored one probable. The Canucks won seven Distinguished Flying Crosses and four Air Medals.

Other Canadian formations in Korea—they are still on duty there—are an 8,000-man infantry brigade and a division of three destroyers.

in collaboration with the United States, on a costly radar chain stretching across the Canadian Arctic. An entirely new organization, the RCAF Ground Observer Corps, came into being.

The Canadian Navy, caught up in the tempo of expansion, ordered a new $20,000,000 carrier, *HMCS Bonaventure*. She decided to replace her British-built piston-engine Sea Fury fighters with US McDonnell Banshee jets.

Orders were placed for an anti-submarine successor to the Grumman Avenger. It, too, was a Grumman aircraft, the twin-engine S2F. An estimated 150 of these aircraft are to be built under license in Canadian plants.

Pride of the RCAF is the First Air Division, with headquarters at Metz, France, and a large supply depot at Langar, England.

Under its control come four three-squadron Sabre wings based at Grostenquin, France; Solingen and Zweibrücken, in Germany; and North Luffenham, in England. The North Luffenham wing is due to be transferred this year to a new base on the continent, at Marville, France.

The Canadian air division numbers some 300 Sabres, operationally alert, manned and serviced by experienced crews. The first aircraft were shipped overseas. Later squadrons crossed the North Atlantic under their own power. Every one of these aircraft is scheduled to be replaced with a faster, higher-flying Sabre, the Mark V. First deliveries have already been made.

The Sabre V is a combination of the RCAF's original F-86E and the Canadian-built Orenda engine. The Orenda delivers about 1,500 pounds more thrust than the earlier, US-supplied General Electric J-47 engine. As the earlier Sabres are replaced they will go into a NATO supply pool for distribution to the air forces of member states. Some speculation points to West Germany as the eventual recipient of RCAF-surplus Sabres.

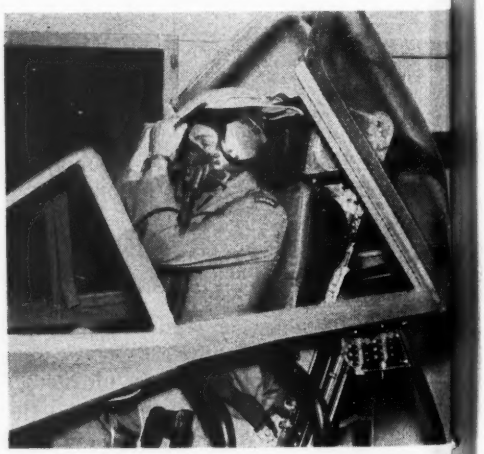
RCAF transport operations cover the globe. Here a North Star transport of the 412th Squadron stops off at Gibraltar. The North Star, Canadian-built adaptation of the DC-4, is powered by four Rolls Royce Merlin in-line engines.

At home, RCAF Air Defense Command controls four all-weather jet squadrons flying CF-100s. Another five such units are in the advanced planning stages. Planned locations of the new squadrons is secret, but the intention is to place them in an arc behind the US-Canadian radar fence.

RCAF Transport Command, with commitments around the globe, has five squadrons equipped with long-range North Stars and Fairchild C-119 • Packets and shorter-range twin-engine Dakotas and Expeditors. One squadron operates two de Havilland Comet jet transports. These high-speed, high-altitude craft are used to exercise air defense units by simulating enemy raiders.

RCAF Maritime Command, with bases on Atlantic and Pacific coasts, comprises three squadrons of Lancasters, substantially modified to accommodate the latest in anti-submarine gear. Expected within the next few months is an interim supply of US Lockheed P2V Neptune patrol bombers. These will complement the Lancasters until the RCAF's new reconnaissance plane is ready. This aircraft will be a redesigned version of the British Bristol Britannia [see "Tech Talk," May AIR FORCE], powered by US Wright Turbo-Cyclone engines instead of the original Proteus turboprops. Eighty have been ordered. The RCAF Britannia will bear almost no resemblance to the original. Wings and fuselage have been redesigned to accommodate heavy armament and radar and a greater fuel load. Endurance will be twenty-four hours.

The Big Four of the Canadian aircraft manufacturing industry are, in order of employment, Avro Canada Ltd. at Malton; Canadair Ltd. at Montreal; de Havilland of Canada at Toronto; and the aircraft division of Canadian Car & Foundry Co. Ltd. at Fort William.



Trainees learn CF-100 cockpit procedure in mobile training units.

Avro, largely British-financed, recently delivered to the RCAF its 1,000th Orenda jet engine—the powerplant of the CF-100 all-weather fighter and the Sabre V.

In quantity production also is the Mark IV CF-100, carrying 106 rockets in wing pods and a belly mounting, and eight .50 caliber machine guns. Nearly 700 of these aircraft are on order.

The CF-100, according to Avro, is the longest-range jet fighter in service. An RCAF CF-100 recently

(Continued on page 54)

Eclipse-Pioneer Polar Path marks a new high in navigation efficiency

New, lightweight compass system provides super-accurate navigation anywhere in the world

Here is a compass system so accurate, so compact, so flexible, and so broad in application that *it may be used as a directional reference on any type operational aircraft anywhere in the world.*

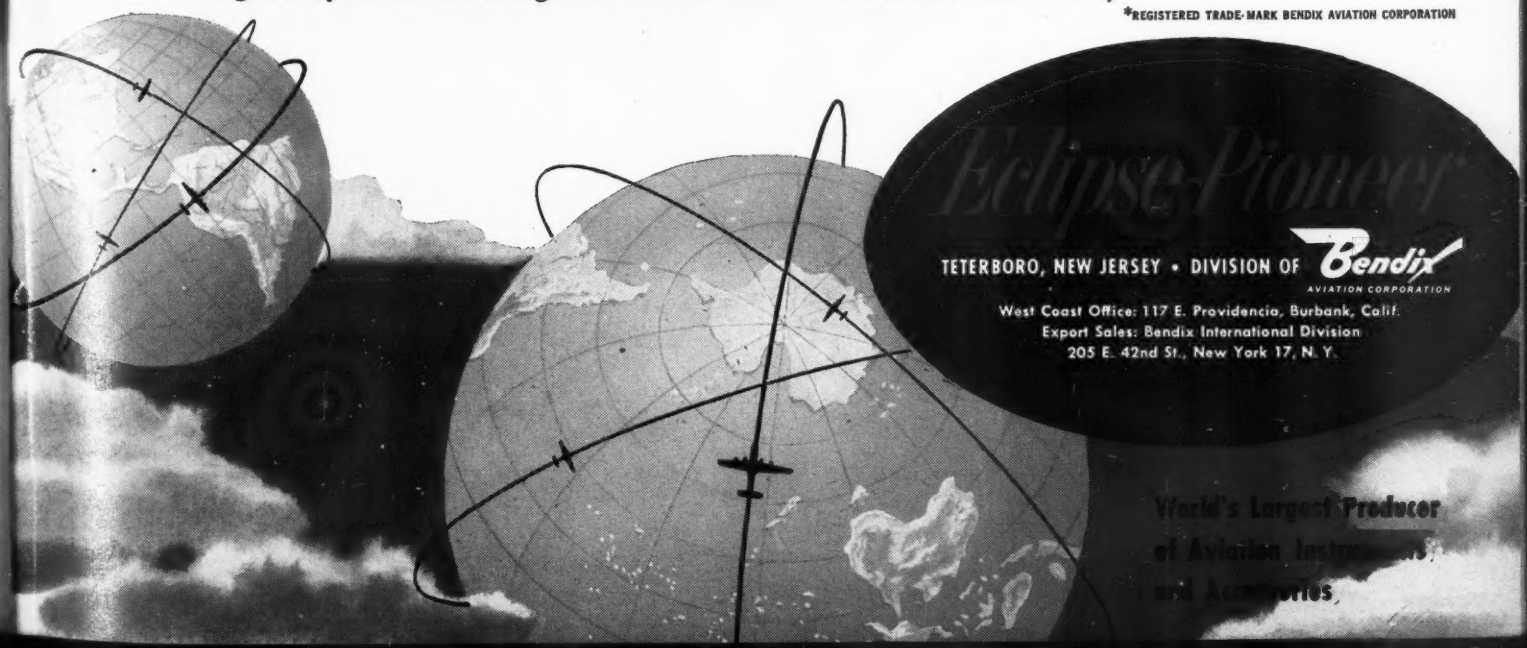
The Eclipse-Pioneer Polar Path is a gyro-compass system that utilizes the same type high-accuracy gyro which so successfully blazed the trail during 1952 in over-the-Pole gyro navigation. Polar Path can be used solely for directional reference, if desired. Or it can be used to provide directional control for an auto pilot, a bomb director, automatic approach system or other device requiring super-accurate directional reference at any latitude.

Among the many important advantages of Eclipse-Pioneer Polar Path are the following:

- **It meets, or betters, the performance and weight requirements of the latest applicable military specifications for compass systems.**
- **It combines the delicate accuracy of a proved gyro navigation system with the long-term reference reliability of a new Flux Gate* transmitter weighing less than one pound.**
- **It is designed for all operational types of aircraft from carrier-based fighters to multi-engine aircraft, including bombers and commercial transports.**
- **The controller, with its functional selector switch, latitude correction scale, and synchronizing and course-setting controls, is compact . . . designed for convenient console mounting and ease of operation.**
- **The Flux Gate system is always available for standby compass when desired.**

As an Eclipse-Pioneer development, Polar Path is engineered and manufactured by the world's largest producer of precision gyros for aircraft use. Gyros of the super-accurate type used in Polar Path have for some time been *mass-produced* by Eclipse-Pioneer. And it is super-accuracy . . . plus great flexibility . . . that mark Polar Path as the *modern* compass navigation system. For full details, write us today.

*REGISTERED TRADE-MARK BENDIX AVIATION CORPORATION



Eclipse-Pioneer

TETERBORO, NEW JERSEY • DIVISION OF Bendix AVIATION CORPORATION

West Coast Office: 117 E. Providencia, Burbank, Calif.
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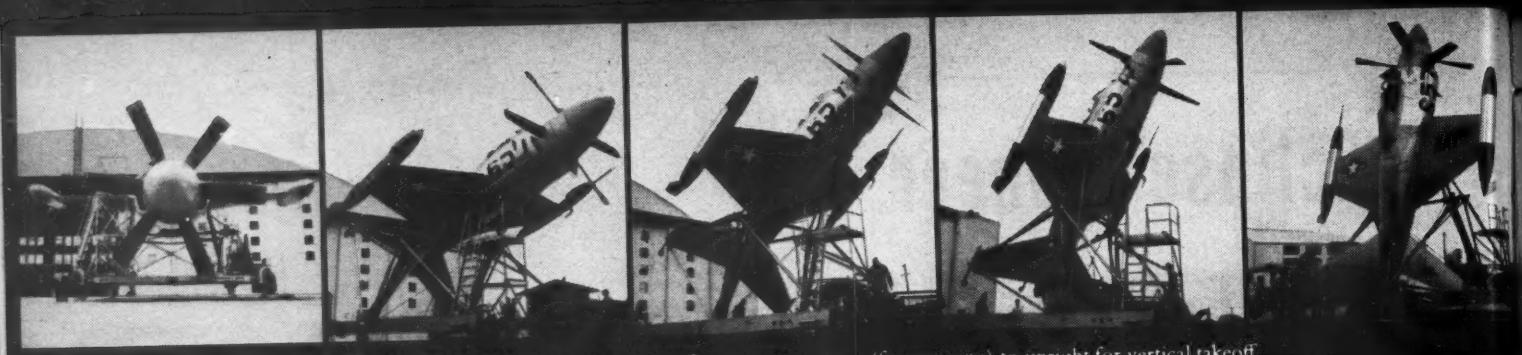
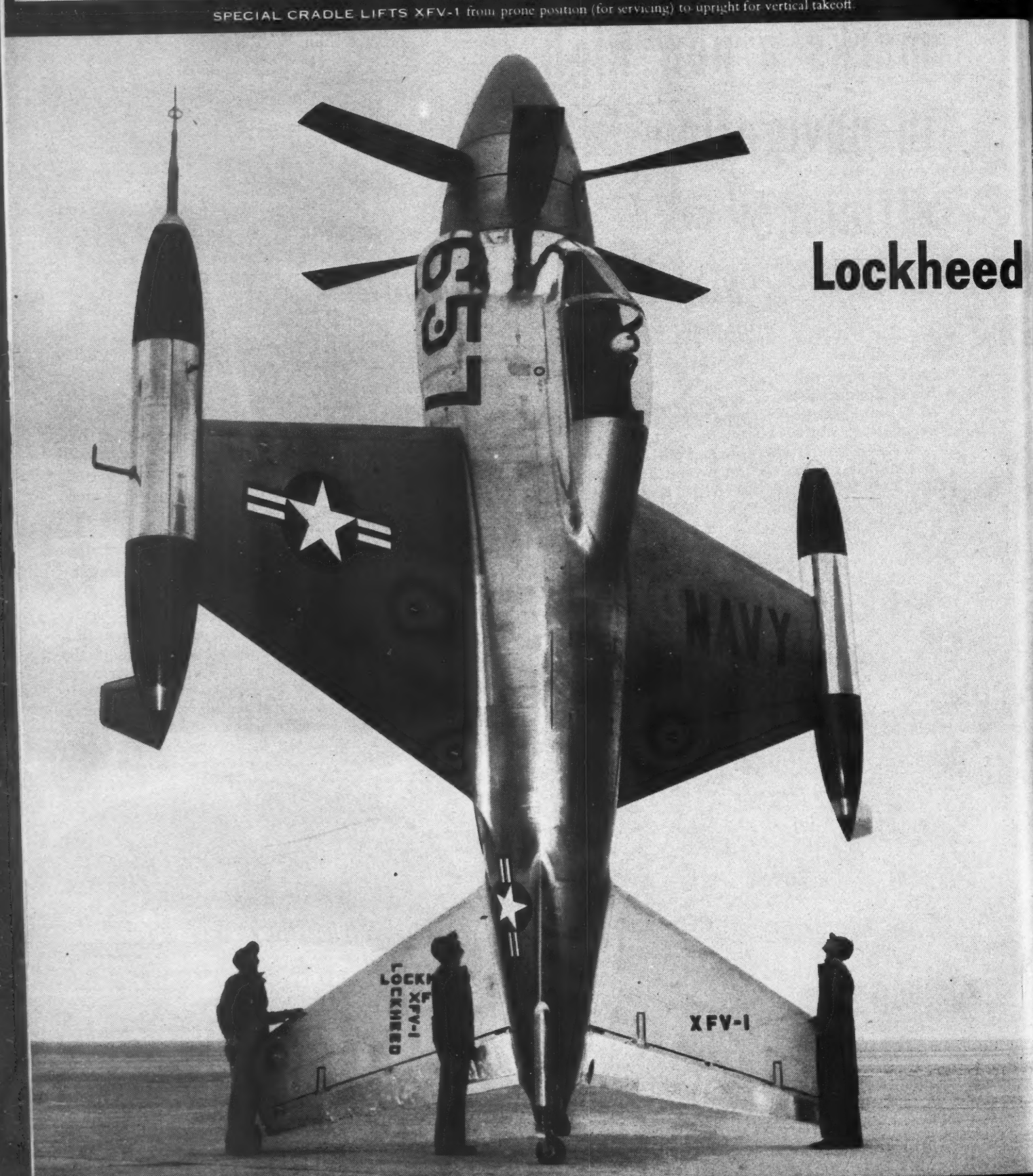
World's Largest Producer of Aviation Instruments and Accessories

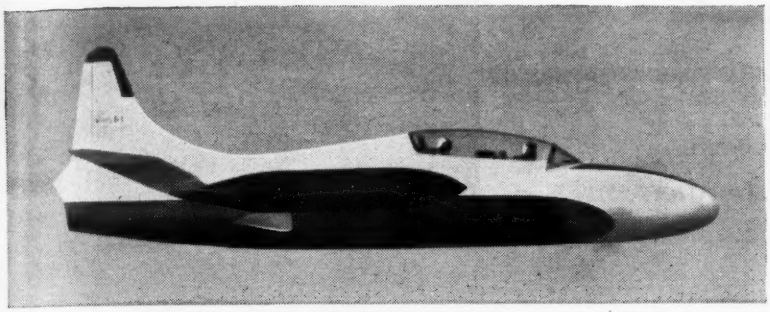


SPECIAL CRADLE LIFTS XFV-1 from prone position (for servicing) to upright for vertical takeoff

Lockheed



LEADERSHIP DEMANDS CONSTANT ACHIEVEMENT



WORLD'S SAFEST JET AIRPLANE. Greater power, larger cockpit, but, above all, more safety have been engineered by Lockheed into its new jet trainer. New stall slats, drag chute, Zero Reader and pilot "stick shaker" device to automatically warn about possible stall are just a few of added safety features. Trainer combines jet combat performance with maximum operational safety. Easier to fly than simple propeller-driven trainers.

GUIDED MISSILE and pilotless aircraft research is advancing rapidly at Lockheed. Here engineer-scientists from the Missile Systems Division test top-secret developments to meet problem of supersonic speeds yet unattained.

Scientists Unveil Radical Forms of Flight

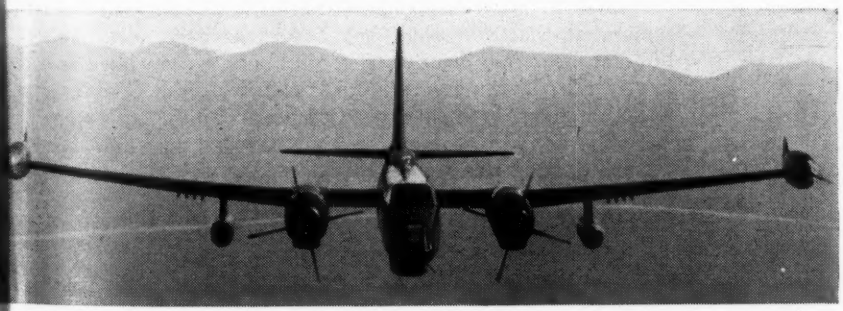
High-Speed Navy Fighter Takes Off Straight Up, Lands by Backing Straight Down on Its Tail

Today's biggest news in aviation is the Navy's XFV-1 built by Lockheed, a revolutionary new vertical-rising plane.

A powerful Allison turbo-prop engine with two jet turbines turning counter-rotating propellers lifts XFV-1 straight up, rocket fashion. It levels off for speeds in the 500-m.p.h. class, lands on its tail.

Many Lockheed "firsts" are built into this airplane. A ¼-scale model powered by a 76-h.p. electric motor was built and flown to test vertical ascent, transition into level flight, and landing. Careful weight control permitted completion of first prototype hundreds of pounds less than estimated weight for Navy requirements.

Unique 4-way tail serves as a single surface and jointly functions as elevator, aileron and rudder, using revolutionary interlocking controls.



SOUND ENGINEERING pays off with Lockheed P2V Navy patrol bomber. The famous Neptune has increased gross takeoff weight and boosted speed by adding powerful jet pods. Neptune's aerodynamic configuration, however, remains unchanged from original X model 11 years ago through the current 7 series.

FIRST ROUND-THE-CLOCK flying radar station in the world is this Lockheed Early Warning Aircraft (designated WV-2 by Navy and RC-121C by Air Force). Huge 600-gallon tip-tanks extend radar-laden Super Constellation's range. Plane carries more scientific equipment than any other known aircraft—some six tons of electronics. Bottom radome, the size of a swimming pool, is largest plastic part ever built. Although it is held to plane by only 10 bolts (no metal ribs), radome is built to withstand aerodynamic pull of up to 60,000 pounds. Super Constellation's three-tail design insures aircraft controllability despite air-flow disturbance created by protruding radomes.

Lockheed

California Division—Burbank, California
Georgia Division—Marietta, Georgia
Missile Systems Division—Van Nuys, California
Lockheed Aircraft Service—Burbank, California
Lockheed Air Terminal—Burbank, California

LOOK TO LOCKHEED
FOR LEADERSHIP

NEW FLIGHT FORMS are studied by Lockheed scientists to meet sonic and thermal problems of ultra-high speed, higher altitudes. Nearly a decade of research on wing shapes alone results in new Lockheed forms in Mach 2 to Mach 3 range. Lockheed has tested almost 100 distinctly different wing models on supersonic rockets.

AMC's Management Philosophy

An exclusive AIR FORCE Magazine interview with Gen. Edwin W. Rawlings, Commander, Air Materiel Command

Q. GENERAL, what are your responsibilities?
A. The Air Materiel Command, which I currently head, is responsible for all Air Force logistics operations in the continental United States and also provides world-wide technical assistance in the logistics field to all Air Force units, world-wide. In other words, the sole reason for the existence of the Air Materiel Command is to provide logistics support to the operating elements of the Air Force.

Q. What is your appraisal of our present status?
A. Frankly, developments in the logistics field of support and supply have not kept pace with the striking speed of a modern Air Force. Our aircraft, which travel at subsonic and supersonic speeds carrying weapons of mass destruction, obviously put terrific pressure on the speed required for proper support. To say it another way, the speed and destruction of our weapons cannot be capitalized on to the maximum degree unless logistics support is available at the right time and place. We recognize this problem and have a program to speed up both paper work and physical movement of support equipment. This, to my mind, will provide the timely support required by these new weapons. We have a long way to go but I am happy to say that we are making great progress.

Q. What is your most difficult problem?
A. Well, we have many problems, but as one finds in almost any business or operation personnel problems head the list. The Jet Age requires flexible people, people who can come up with new ideas and who are willing to accept new ideas in the broad field of management required to match the speeds of today's weapons. We have a large turnover of key civilian employees who transfer to industry. In the case of military personnel we have the usual rotations which means that we have to constantly train replacements in technical fields. We are working very hard at this. I am happy to say that we have many people with skillful capabilities and we are making progress to improve our procedures.

Q. Why do you worry about the acceptance of new ideas and ways of doing things?
A. In an operation as large as ours it is bound to take time for people to adjust themselves to new concepts and new situations. If a department store suddenly moves its men's apparel shop from the first to the fourth floor it will take time for both employees and customers to get used to the move. If a firm installs a completely new auditing system it will take time for old-timers to adjust themselves to the new techniques, instructions, and procedures. In our business, where people have computed pipeline times in terms of months instead of days or weeks, some may not recognize the necessity for keeping pace with the changing "state of the arts" such as the speed-up in times caused by our change from reciprocating engines to jets.

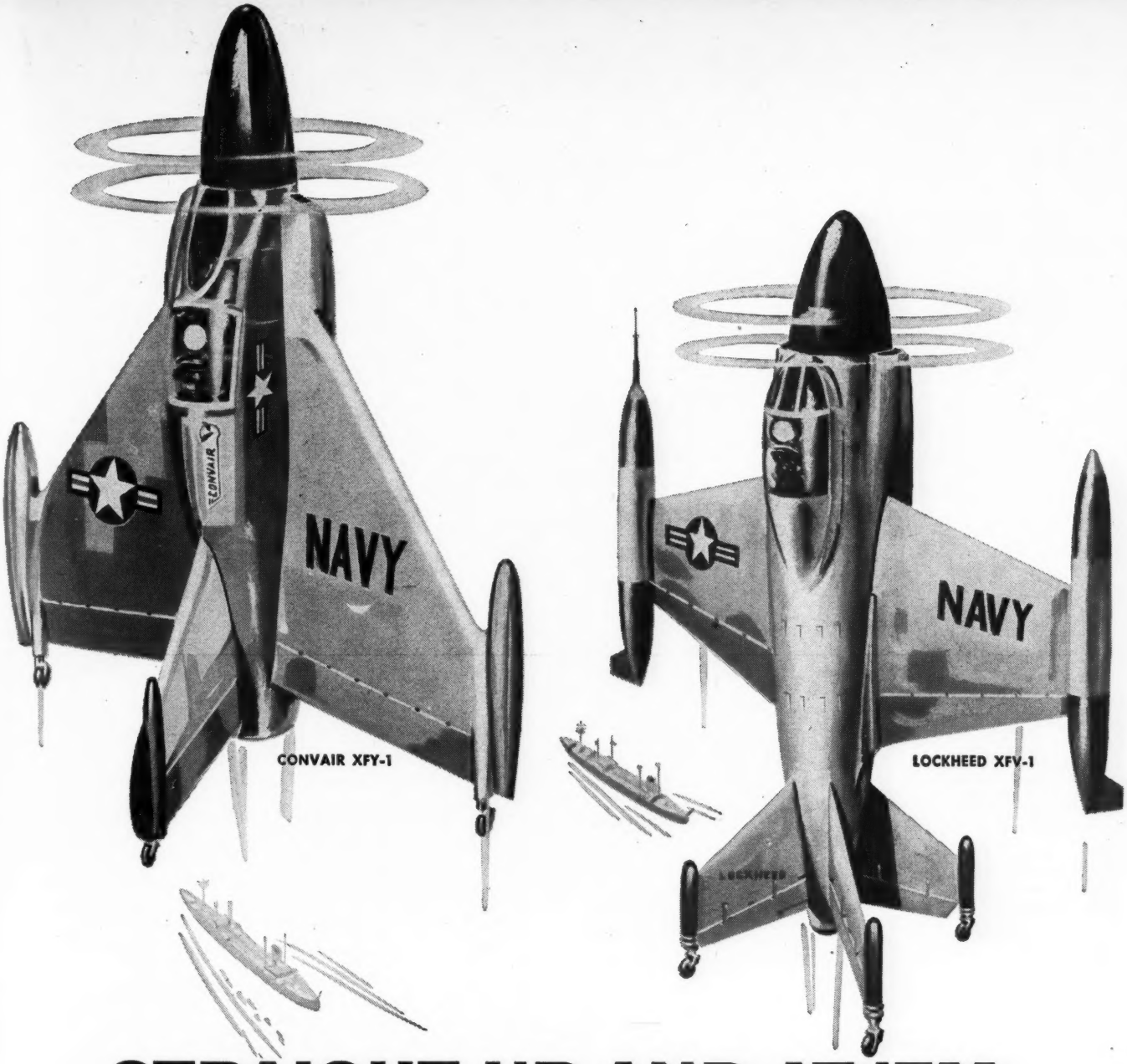
Q. Then the Jet Age is causing difficult management problems as well as technical problems?
A. Very definitely so. In this era of high-speed, long-range aircraft which are able to carry weapons so devastating that they can destroy huge cities with one blow we must manage our resources in such a way that we can employ these weapons at a moment's notice. The first few days of a major war could be decisive and in any event they would certainly be extremely destructive. We, in the logistics business, must support our striking forces so they can strike back at a moment's notice.

Q. Then do you think an all-out war will be over quickly?
A. No, I would not say that. However, we must be prepared to face that possibility. At any rate, we must remember that we won't have years or even months to build up our mobilization potential such as we have had in the past. This means that we in Air Materiel Command must manage our business so that our striking forces can have the support to move in a matter of hours and days instead of months or years.

Q. How does industry fit into this picture?
A. They are on our ball club. We must and do work in close cooperation with industry to develop more rapid operating procedures. As you know, industry provides the spare parts, ground handling and test equipment and other supplies so essential to a "Ready to Go" fighting force. Industry is most cooperative with us and I am glad to say that the bulk of the airframe and equipment industry understands this problem.

Q. You mean the problem of acting speedily?
A. Yes. Let me give you an example of what has happened. Between World War I and World War II our speeds and altitudes doubled and between World War II and today our speeds have tripled and altitudes doubled again. I think you will agree that World War I thinking had little place in World War II, and by the same token World War II thinking has little room in today's picture. We're thinking with Mach numbers today instead of miles per

(Continued on page 48)



STRAIGHT UP AND AT 'EM

U. S. Navy VTO Fighters powered by ALLISON Turbo-Prop Engines

HERE you see the Navy's approach to the problem of providing protection for wartime convoys – two revolutionary new interceptors that take off vertically and can operate from the deck of a freighter or from any ship the size of a destroyer.

Both the Convair XFY-1 and the Lockheed XFV-1 are powered by an Allison twin-power section Turbo-Prop engine delivering more than 5500 horsepower.

These new planes combine the take-off and landing features of a helicopter with the high-speed performance of a fighter plane. They require no runways, can land in a very small area. Without the dual rotation feature of the Allison T40 Turbo-Prop engine, flight control would be impossible during take off and landing.

Now undergoing preliminary testing, these experimental VTO fighters are further evidence of the far-sighted policy of the Bureau of Aeronautics in sponsoring Turbo-Prop development. Allison is proud to be supplying the engines for both of these planes—proud, too, of its leading role in the design and manufacture of this promising new type of aircraft power.*

**Also Builders of T56 Turbo-Prop engines and J71, J35 and J33 Turbo-Jet engines.*

GM GENERAL MOTORS Allison

DIVISION OF GENERAL MOTORS, INDIANAPOLIS, INDIANA

The AIR MATERIEL COMMAND

1

Commander
Gen.
Edwin W Rawlings

2

Vice Commander
Maj. Gen.
William F McKee

3

Deputy Commander for Production
Maj. Gen.
Clarence S. Irvine

4

Inspector General
Brig. Gen.
Frederic H. Miller, Jr.

5

Office of Information Services
Col. Erwin G Merrison

6

Chaplain
Col.
Leonard C. Habetz

10

Executive
Col.
Joseph T. Kingsley

8

Staff Judge Advocate
Col. Moody R. Tidwell, Jr.

9

Quality Control
Col.
Carl F. Damberg

11

Directorate of Procurement and Production
Maj. Gen.
David H. Baker

12

Deputy
Col Harley S Jones

13

Administrative Operations
Col.
Robert J. [illegible]

20

Directorate of Supply and Services
Maj. Gen.
Lewis R Parker

21

Deputy
Brig. Gen.
Frederick J. Dau

22

Administrative Office
Mr.
Joseph B. [illegible]

31

Directorate of Maintenance Engineering
Maj. Gen.
Carl A Brandt

32

Deputy
Brig. Gen.
Walter W. Wise, Jr

33

Research Analysis
Col. Claire [illegible]

37

Directorate of Personnel and Support Services
Brig. Gen. Alvord
V. P. Anderson, Jr.

38

Deputy
Col. John F DeVos

39

Plans & Requirements Division
Mr.
William A. [illegible]

45

Comptroller
Maj. Gen.
Phillips W. Smith

46

Deputy
Col.
Edward B Gallant

47

Management Analysis
Col.
Marshall [illegible]

53

Assistant for Programming
Brig. Gen.
C. Pratt Brown

54

Deputy
Col.
Chester G Martz

55

Administrative Office
Col.
Glenn [illegible]

An AIR FORCE Magazine Chart
(Corrected as of May 8, 1954)

Air Force Depots

Air Materiel Areas

14 **Office of Inspection**
Lt. Col.
William C. Robinson

15 **Office of the Procurement Committee**
Mr. Russell W. Burns

16 **Plans and Programs Office**
Col.
Maurice S. Benedict

17 **Procurement Division**
Brig. Gen.
William P. Farnsworth

18 **Production and Resources Division**
Maj. Gen.
Kern D. Metzger

19 **Field Operations Division**
Col. Lee W. Fulton

23 **Special Weapons Office**
Col.
Harry C. Porter

24 **Equipment Authorization Division**
Col.
James M. McCampbell

25 **Procedures and Field Operations Division**
Col.
Lloyd W. Thacker

26 **Transportation and Packaging Division**
Brig. Gen.
James L. Riley

27 **Programs and Requirements Division**
Col.
Darwin E. Elliott

28 **Materiel Control Division**
Lt. Col.
Harry A. Lange

29 **Air Force Services Division**
Col. Howard Moore

30 **Cataloging Division**
Col.
George E. Keeler, Jr.

34 **Maintenance Engineering Plans and Management Division**
Col.
Victor L. Anderson

35 **Administration Office**
Lt. Col. John H. Casanave, Jr.

36 **Maintenance Engineering Services Division**
Col. Maurice L. Dyer

40 **Civilian Personnel Division**
Col.
Jack W. Bowman

41 **Installations Division**
Col.
Edward C. Gill

42 **Ground Safety Office**
Col.
Leonard F. Carter

43 **Operations and Training Division**
Col.
Edmund J. Borowski

44 **Military Personnel Division**
Col.
Gilmore V. Minnis

48 **Accounting Division**
Col.
Wendell E. Carter

49 **Manpower and Organization Division**
Col. Richard B. Uhle

50 **Budget Division**
Col.
Dan H. Yeilding

51 **Finance Division**
Col.
James H. McCown

52 **Statistical Services Division**
Col.
Aaron L. Johnson

56 **ANG Affairs Office**
Col.
Joseph T. Montague

57 **Plans Division**
Col.
Charles C. Andrews

58 **Programs Division**
Col.
Ronald A. Johnston

59 **Mutual Security Division**
Lt. Col. Albert J. Clocksin

60 **Gentile AFD, Dayton, Ohio**
Col. Leslie G. Melzer

61 **Wilkins AFD, Shelby, Ohio**
Col. Glenn C. Thompson

62 **Rome AFD, Rome, N.Y.**
Col. Milton F. Summerfelt

63 **Gadsden AFD, Gadsden, Ala.**
Col. Solomon J. Zellner

64 **Mallory AFD, Memphis, Tenn.**
Col. William P. Sloan

65 **Topeka AFD, Topeka, Kans.**
Col. Thomas R. Lynch

66 **Choli AFD, Maywood, Calif.**
Col. Walter S. Lee

67 **Newark Transportation Central Depot Newark, N.J.**
Brig. Gen. Darr H. Alkire

68 **Middletown AMA, Middletown, Penna.**
Maj. Gen. Lyman P. Whitten

69 **Sacramento AMA, Sacramento, Calif.**
Brig. Gen. William T. Hefley

70 **Warner Robins AMA, Warner Robins, Ga.**
Maj. Gen. Kingston E. Tibbetts

71 **San Bernardino AMA, San Bernardine, Calif.**
Maj. Gen. Edmund C. Langm

72 **Mobile AMA, Mobile, Ala.**
Maj. Gen. Frederick R. Dent,

73 **Wright-Patterson AFB, Ohio**
Col. Paul L. Barton

74 **San Antonio AMA, San Antonio, Tex.**
Brig. Gen. Thetus C. Odom

75 **Ogden AMA, Ogden, Utah**
Brig. Gen. Manning E. Tiller

76 **Oklahoma City AMA, Oklahoma City, Okla.**
Maj. Gen. William O. Senter

hour. Our effective industrial partners of tomorrow will recognize today these Jet Age requirements and gear their management programs accordingly. Management philosophy will have to be adapted to match jet speeds.

Q. By that, do you mean you plan to cut "red-tape"?
A. Unfortunately, large-scale operations involve a certain amount of "red-tape." This is true because a huge operation requires reports, surveys, etc., to provide suitable tools for efficient management. However, we are doing everything possible to reduce so-called "red-tape" through streamlining of procedures, the use of summary control information rather than detail, and putting our efforts on the most significant dollar areas. The big job is to shorten the time required for these administrative practices.

Q. Could you give us an example?
A. Yes. Although there are many, I think our Air Materiel Command decentralization program is a most important one. We found that we were handling over a million pieces of correspondence a month at our Headquarters at Wright-Patterson AFB in Dayton, Ohio. An analysis of this correspondence indicated that some eighty percent of it involved something on the order of twenty percent of the dollar value of items with which we were dealing. This mass of paper was caused by our highly centralized type of operation, and obviously, was of such volume that it became almost impossible to manage properly. We were receiving complaints from our customers such as Air Defense Command, Tactical Air Command, and others who are the operating elements of the Air Force. We studied large industrial operations, many of whom had the same experience, and determined that our entire method of operation had to be changed to one of decentralized control and decentralized operations. In this way we were able to place the bulk of our operating activities in our fifteen Depots scattered throughout the United States, retaining over-all planning and management control in this Headquarters. This has resulted in reducing Headquarters personnel some 6,000 people and has speeded up the entire operation.

Q. Along that line, you have conducted an aggressive management and cost-consciousness program for almost three years. Considerable emphasis has been placed on saving money. What happened to the money saved?
A. We have used it to buy more airplanes and equipment for the expanding Air Force than we would have otherwise been able to buy. We bought more Air Force for the dollars appropriated to us. This cost-consciousness has had many beneficial effects in our operation. It put our people on their toes and caused them to re-evaluate the way we were doing things to improve our methods and procedures. It improved our over-all management. I think there should be a word of caution in connection with cost-consciousness, however.

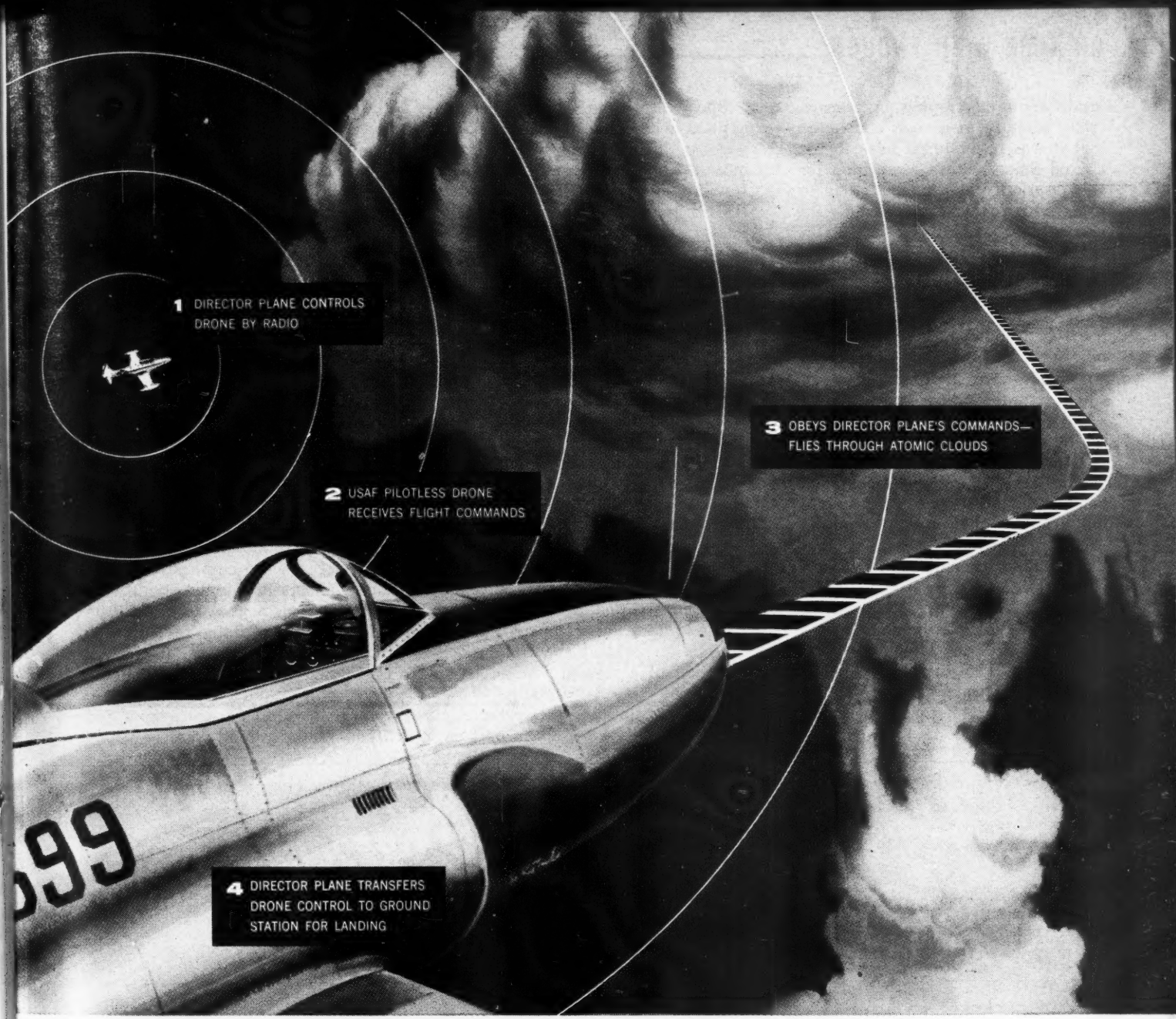
Q. What do you mean by that?
A. I mean that we must always keep in mind the purpose for which we exist, and that is to be strong enough to prevent a war, if possible, and in any event to be able to win one in case we are forced to fight. It takes a high level of *esprit* and morale to win a war. You cannot measure a striking force's combat efficiency in accounting terms. A war is wasteful—there is no possible monetary or physical profit in it—only the victory which preserves our way of life. From a strictly military point of view, we must conserve all of our resources to insure sufficient strength to subdue our enemy. Therefore, we must practice economy in such a way that it helps us to conserve these vital resources but at the same time does not change our fighting men into bookkeepers. I personally feel that we have not reached this extreme cost-consciousness yet but we must be aware of the dangerous implications while pursuing this management improvement philosophy in the Air Force.

Q. Where does the tactical commander fit into the logistics picture?
A. The tactical commander is the one who really determines the rate at which our resources are conserved or wasted. He also heads the fighting unit. If he manages his resources well he will be in a better position to meet the enemy than if he does not do so. On the other hand, he cannot become so involved in the management job that he forgets his main purpose in life, which is to fight if necessary, and win. It is for this reason that I feel so strongly that tactical commanders are no longer just fighting men but also must be managers as well. I am happy to say that in our close work with the commanders of our tactical organizations we are finding them more and more aware of the importance of managing their logistics properly.

Q. How for instance?
A. Take engines, for example. As you know we work continuously with industry to improve the quality of our engines. As a result of improvements and design and manufacture, the life of our engines has been greatly lengthened. However, the tactical commander also plays a big part in improved jet engine life, through the prescribing of best operational procedures and the use of field-level maintenance to a greater degree. This, coupled with improved manufacture has increased the jet engine life as much as three times between engine overhaul. Not only does this procedure keep more airplanes in the air but it also reduces depot maintenance personnel requirements.

Q. Suppose this country were bombed tomorrow—are we ready for it?
A. That's a very broad and very tough question to answer and I don't have a crystal ball. However, I'll say this—if we are attacked we will strike back quickly. To do it, we will have to hit with what we have on hand and not what we wished we had. As I said, our job at AMC is to be continually ready to support our striking forces, such as SAC, until the enemy says "enough." Industry's job is to back us up and replenish and produce weapons we will need to complete our mission.

Q. What it boils down to, then, is: A, one country has the ability to bomb us suddenly and our job is to manage our affairs so we can hit back quickly; B, tactical commanders must also be good managers but they have the fighting job and we should not carry petty cost-consciousness to the degree that they become bookkeepers rather than fighters; and C, if an all-out war comes we must be ready to fight with what we have on hand.
A. That's right. Today, it seems clear, beyond question, that strategy based on surpluses no longer can be employed. We must now manage and handle our resources from strictly a military management point of view, in such a way that we can launch a massive counter air offensive at a moment's notice should that become necessary. The heaviest responsibility in the logistics field lies in the development, *and now*, of the tools required for Jet Age management when and if war comes. If we keep our eye on that ball, we will get what we are after—namely—the capability to defend the life of our nation.—END


1 DIRECTOR PLANE CONTROLS DRONE BY RADIO
2 USAF PILOTLESS DRONE RECEIVES FLIGHT COMMANDS
3 OBEYS DIRECTOR PLANE'S COMMANDS— FLIES THROUGH ATOMIC CLOUDS
4 DIRECTOR PLANE TRANSFERS DRONE CONTROL TO GROUND STATION FOR LANDING

Pilotless Jets Penetrate Atomic Cloud in Tests

BRING BACK DATA PREVIOUSLY IMPOSSIBLE TO SECURE

THE STORY BEHIND THE STORY:

■ Mix the drama of atomic tests and pilotless flight and it's page one news. Such was the case when the U. S. Air Force thrust pilotless jet drones into the heart of atomic clouds and landed them safely – with their cargo of mice and monkeys – for scientific study by the Atomic Energy Commission.

■ The story behind the testing of the effect of radiation on animals is one of pilotless flight, "beep" pilots and precise Sperry controls. Lockheed QF-80 drones, specially equipped with Sperry remote flight control systems, fly through atomic clouds guided by radio and radar.

■ These drones are flown remotely by skilled USAF pilots who use "beep" boxes to command them – either from director planes in the air or control stations on the ground for take-off and landing. Under their radio commands the drone takes off, at the proper speed retracts its landing gear, climbs to the desired altitude, banks and turns and keeps the airspeed necessary to arrive at an exact point in the atomic cloud at a prescribed second.

■ This remarkable flight control system brings the drone through the awesome turbulence of the atomic cloud under complete control—on course and altitude. Returning to its airbase, the radiation-saturated drone lands as precisely as though a veteran pilot were at its controls.

■ Sperry is an old hand at pilotless flight. It developed the first guided missile—an aerial torpedo for the Navy – back in 1915. And since 1912, Sperry has been the leader in developing automatic flight controls for *piloted* flight. Sperry automatic pilots are installed on military and commercial planes the world over.

SPERRY GYROSCOPE COMPANY

DIVISION OF THE SPERRY CORPORATION • GREAT NECK, N.Y.

inside required ripping open each crate. Military men soon concluded that it was faster to go back to the United States with a requisition for a high-priority air shipment than to rip through the boxes seeking a needed item. And yet the item was probably in one of the crates.

No one will deny that the military needs multi-billion dollar bases overseas. But no one will deny that the taxpayer should receive maximum mileage from his dollar. The people who believe in aerial logistics are convinced that this concept will strike the delicate balance between the two extremes.

NEAC offers proof that airlift will work. But the airplane is only one facet of the airlift concept. True mobility can be achieved only when the Air Force breaks the chains that shackle it to its painfully slow supply system.

Even NEAC, which is the best example of what can be done, hasn't been able to throw off the shackles completely. The man who needs the item still can't get it from the man who has it—not without going through a chain of middlemen.

Speeding up the supply system to a point where it can hope to keep pace with operations will require more than a pilot program in NEAC. It will require a change of viewpoint. It will require reduction of stockpiles, fast cargo handling, less packaging, elimination of all but necessary paper work, the right kind of carriers. It will require that people who make policy subscribe to the air logistics' doctrine of "On Time With Enough."

Such a revised logistics concept should make possible dollar savings of millions in peacetime and billions in wartime. It should also save our most scarce commodity—manpower.

Certainly, in an age when nuclear weapons and intercontinental bombers compress war possibly to a matter of hours, it makes little sense to rely on a transport system which takes months to move men and materiels into battle.

The implications of modern aerial logistics go beyond the Air Force. Adoption of a revised logistics system should mean substantial new business for the airlines for the Air Force would have to rely in part on the domestic and international airlines for lift. Airlines would benefit, too, from development of new and more economical aircraft.

The aircraft industry, which includes manufacturers of airframes, engines, electronics equipment, and allied parts, would benefit from the new developments of carriers and the items of equipment needed to keep these carriers in the air.

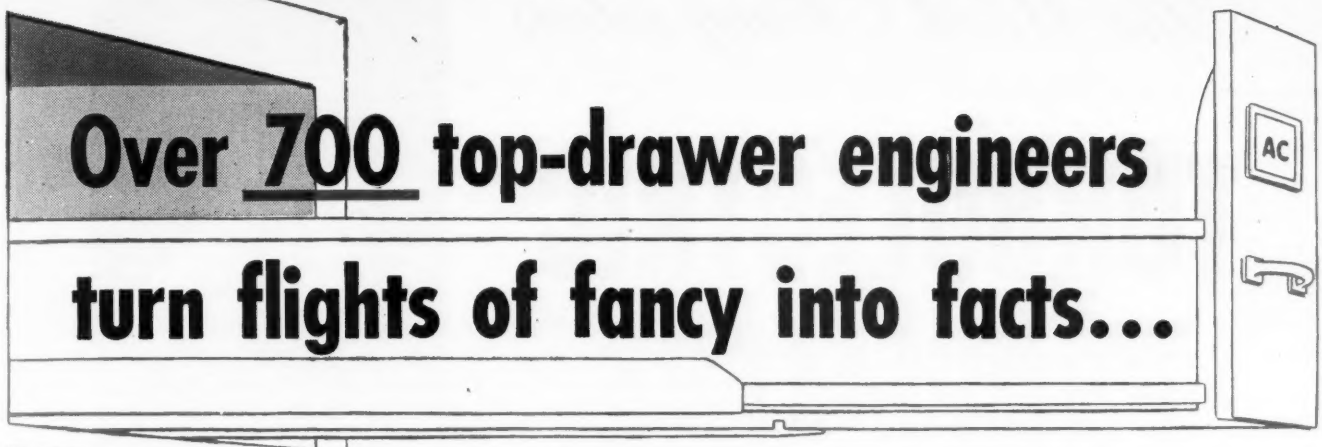
The first steps have been taken. In NEAC, perhaps more than in any other area of the world, aviation has proved its ability to perform where other methods of transportation have failed.

AMC has launched its "Mercury Service." The RAND and other study groups have made available a vast library of research material. Air Transport people and manufacturers have urged more emphasis by military planners in this direction.

All the elements are present to bring about a veritable revolution in the concept of logistics. If the Air Force will put them together there never will come a time when the coiners of phrases can say "Too Much—In the Wrong Place."—END

R.C.A.F. AIR-SEA RESCUE
AB 664
TU
An OTTER of R.C.A.F. Unit Churchill—at 0107 hours Aug. 30/53
made a spectacular landing on a tiny Arctic lake at the scene
of a Lancaster Bomber crash and successfully evacuated
the complete crew of eight and their equipment—
IN A SINGLE FLIGHT!
DESIGNED AND MANUFACTURED BY
THE DE HAVILLAND AIRCRAFT OF CANADA LIMITED
POSTAL STATION "L"
TORONTO, ONTARIO

Over 700 top-drawer engineers turn flights of fancy into facts...

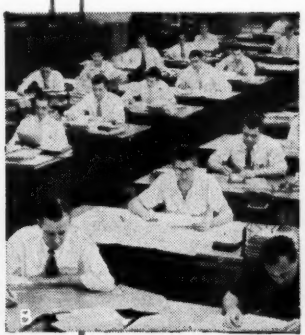


Imagination runs riot at AC—as riotous as cold, hard, engineering facts permit.

Here, the imagination of more than 700 carefully chosen engineers (from more than 150 different colleges and universities) daily translates dreams into new defenses for America.

AC's success in this field is a matter of record—a record of which we are justly proud. Such products, now being built, as the "A" series Gun-Bomb-Rocket Sights—A-1A Bombing Navigational Computers—T-38 Skysweeper Fire Control Systems are examples of AC's unusual ability to handle the toughest electro-mechanical jobs—from development and design straight through final assembly, testing and service in the field.

AC is always ready, willing and more than able to put imagination to work for you on *new* defense problems—the tougher the better. Let AC prove, once more, its ability to turn out top-quality material for the Armed Forces—on or ahead of schedule—at assembly line savings.



A—A group of AC engineers at work in part of the Military Products Engineering Section at Flint. B—A section of AC's Military Products Engineering at the Milwaukee plant. C—Plant layout engineers in Flint see to it that effective grouping of machinery and equipment is utilized to insure greatest economy and efficiency in manufacturing.

GM GENERAL MOTORS GM GOOD MANAGEMENT

AC QUALITY PRODUCTS

AC SPARK PLUG DIVISION . . . GENERAL MOTORS CORPORATION, FLINT, MICHIGAN

DEFENSE PRODUCTS of High Quality at Low Cost DELIVERED ON TIME

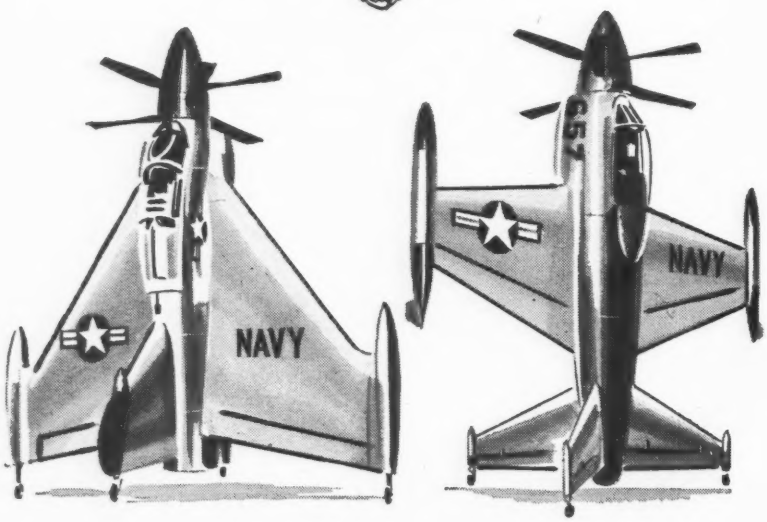
The U.S. Navy selects

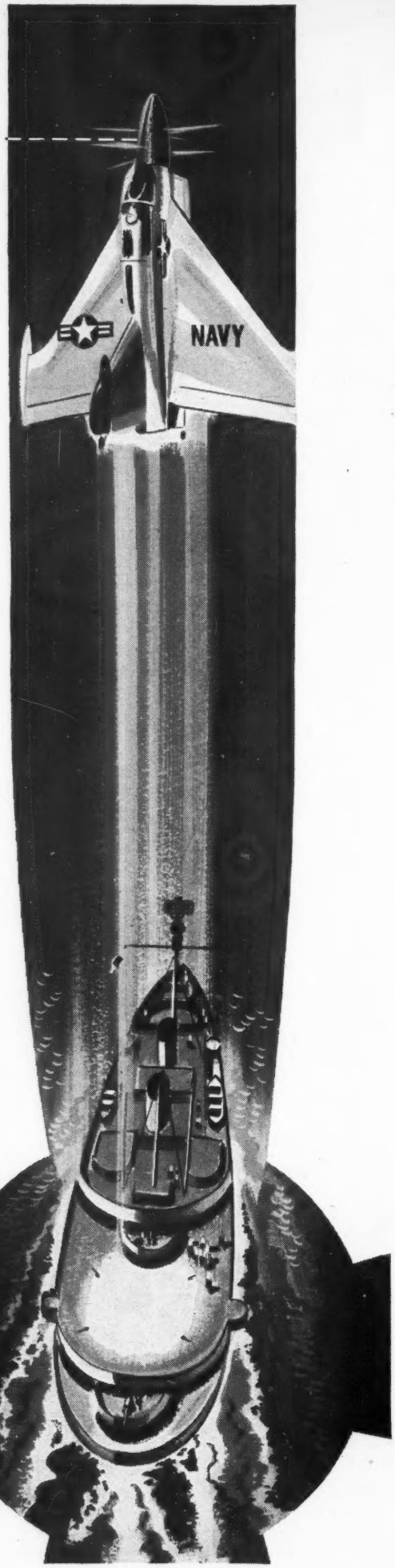
TURBOLECTRIC PROPELLERS

for the NEW

CONVAIR XFY-1 and LOCKHEED XFV-1

vertical take-off fighters

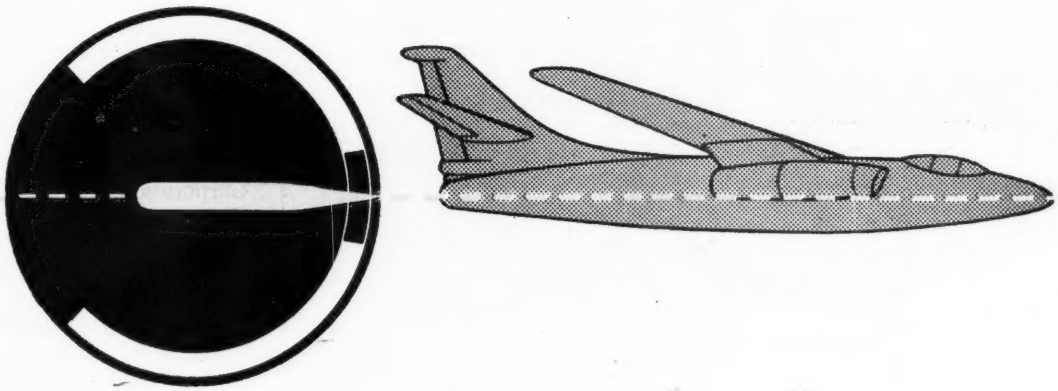




CURTISS-WRIGHT

CORPORATION • WOOD-RIDGE, N. J.

JOBS FOR: ENGINEERS • TECHNICIANS



How AVIEN prevents "seesaw" at 600 m.p.h.

Designed as the Navy's most powerful carrier-based bomber, this Douglas jet uses fuel so quickly it could get dangerously out of balance in a matter of moments. The center of gravity must be controlled automatically.

Avien does this job—and simultaneously tells the pilot on the gage above.

The installation includes Avien's renowned Fuel Gages applied to all fuel tanks, plus an additional function: automatic fore-and-aft center-of-gravity control and indication.

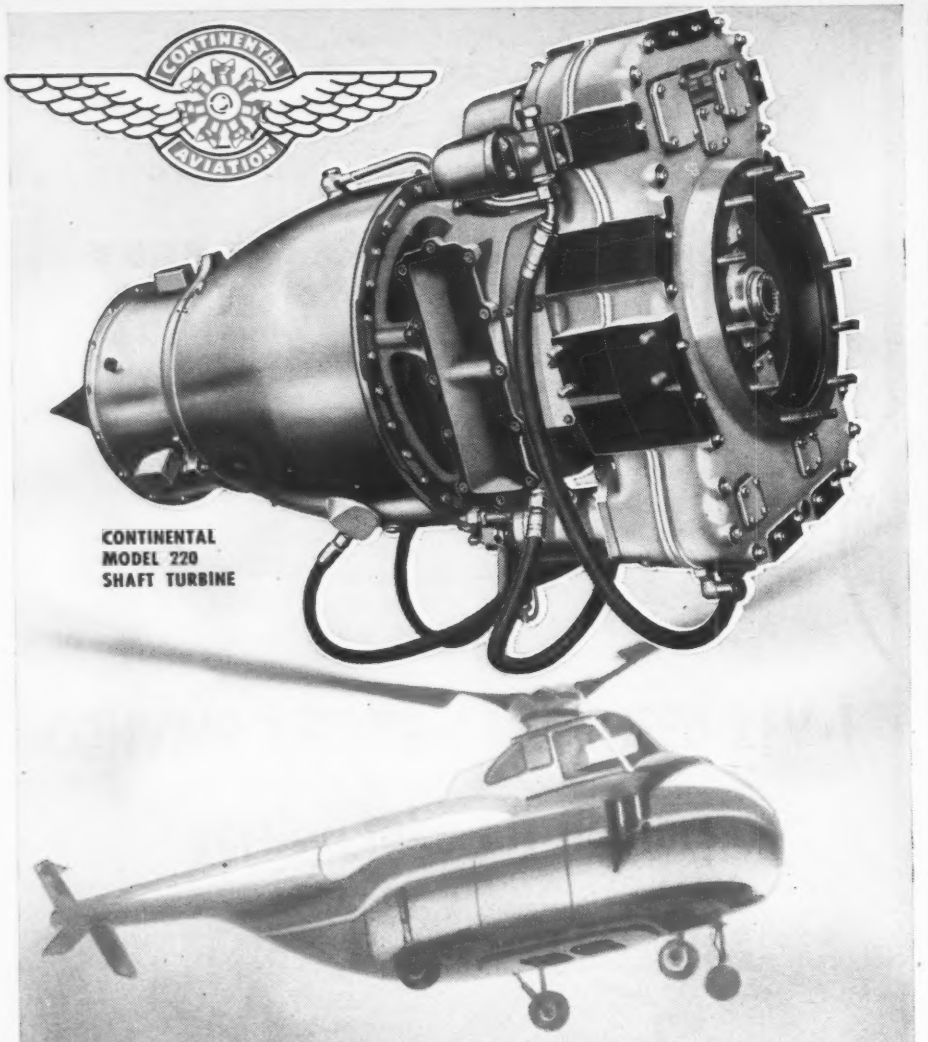
The same tank units are utilized for both capacitance gaging and fuel balancing. Added weight is only 0.33 lb. of wiring! *The fuel gaging and fuel balancing functions are independent of each other electrically.*

Major Avien instrument components have been specified for more than fifty different aircraft models. Avien can meet your specifications with the same kind of engineering adaptability and economy.

When you have a fuel gage or fuel management problem, call on us.

—ENGINEERING IN DEPTH—Avien

58-15 NORTHERN BLVD., WOODSIDE 77, N.Y.,
AIRCRAFT AND INDUSTRIAL INSTRUMENTATION



Jet power
FOR THE AIR AGE

Continental, a great name in power, offers advanced development and modern manufacture to serve those requiring turbine power plants for helicopters, fixed wing aircraft, or other applications. If you manufacture equipment with a present or a prospective use for turbines —shaft power, air generators or jets— discuss your engine problems with C.A.E.

CONTINENTAL AVIATION & ENGINEERING CORPORATION
1500 ALGONQUIN AVE., DETROIT 15, MICHIGAN

SUBSIDIARY OF CONTINENTAL MOTORS CORPORATION

flew 2,200 miles non-stop from Vancouver to North Bay and landed with more than an hour's fuel remaining in its tanks.

Future projects at Avro include a vertical take-off jet based on the gyroscopic principle of flight and a more conventional fighter, the delta-wing CF-105. The latter is said to be about four years off. Its design speed: 1,200 mph.

Canadair Ltd., the nation's greatest volume-producer of military aircraft, recently turned out its 1,000th Sabre. Canadair is a wholly-owned subsidiary of the General Dynamics Corporation, which also controls Convair in the US.

The RCAF ordered from Canadair 575 T-33 Silver Star jet trainers, of which about 300 have been delivered. Most are destined for RCAF training bases but some will be turned over to NATO as mutual aid for member nations.

Biggest future project at Canadair is the Britannia. Once RCAF maritime reconnaissance requirements have been met, a transport version of the aircraft may be built.

The de Havilland company has in production two utility transports of original design, the Beaver and the Otter. The former has been supplied in quantity to the US services; the former is used by the RCAF in search and rescue operations. Late this year de Havilland expects to begin work on a $100,000,000 contract for Grumman S2F anti-submarine aircraft for the Royal Canadian Navy.

Canadian Car & Foundry Co. has begun production for the USAF of Beechcraft T-34 trainers. Its former contract was for some 500 T-6 Harvards for both the USAF and the RCAF.

In addition to Avro, other RCAF engine suppliers are Rolls Royce of Canada, which is assembling Nenes for the T-33s, and Canadian Pratt and Whitney, which is manufacturing its R-1340 Wasp for Harvards and Beavers.—END

James Hornick is Aviation Editor of the Toronto *Globe and Mail*.

GOT THE WORD?

Have you got the word on AFA's 1954 Convention and Reunion, in Omaha, August 19-22? Details on pages 56 and 57 of this issue!

GCA RADAR AND ELECTRONICS
Gilfillan
LOS ANGELES
AROUND THE WORLD

QUESTIONS AND ANSWERS ABOUT GILFILLAN

QUESTION: The name Gilfillan has become synonymous with GCA radar. Is GCA radar Gilfillan's main activity?

ANSWER: No. Gilfillan activities are highly diversified. The company is engaged in: aircraft components manufacture (since 1917); surveillance radar (1942); airborne radar (1944); radar trainers (1945); radar training schools (1946); automatic GCA radar (1947); automatic air traffic control radar (1949); radar countermeasures (1951); ground and air systems for guided missiles (1952); and additional classified projects in related fields since 1953.

QUESTION: Are Gilfillan contracts diversified?

ANSWER: Yes. Gilfillan is now fulfilling development and production contracts for the U. S. Air Force (Air Defense Command, Air Materiel Command, Strategic Air Command, Tactical Air Command); Army Ordnance; Army Signal Corps; U. S. Navy (Bureau of Aeronautics and Bureau of Ships); Royal Canadian Air Force; Royal Australian Air Force; South African Air Force; and for the governments of France and other NATO countries.

QUESTION: Is Gilfillan a World War II company?

ANSWER: No. Gilfillan has engaged in precision research, design and production of aircraft components and electronics equipment since 1912.

QUESTION: Is Gilfillan a small company?

ANSWER: No. Gilfillan has 7 plants, dispersed throughout Southern California.

QUESTION: Has Gilfillan a special reputation for efficiency and versatility?

ANSWER: Yes. Gilfillan has solved difficult electronics design and production problems in a wide range, from the smallest, lightest airborne radar and radar trainers to guidance systems for the largest and most complex guided missiles. Gilfillan has again and again succeeded in effecting great economies in size, weight and number of components, with an increase in efficiency and reduction in cost.

QUESTION: Are Gilfillan deliveries on schedule?

ANSWER: Yes. Gilfillan has an international reputation for dependable, on-schedule deliveries.

QUESTION: Can Gilfillan take on new projects at the present time?

ANSWER: Yes. Current and continuing Gilfillan expansion in equipment and production facilities permits Gilfillan to engage in new problems in related fields.

GILFILLAN, LOS ANGELES--GCA Radar and Electronics

East to meet West in Omaha at

Airpower Roundup!

OMAHA, NEBRASKA

AUGUST 19-20-21-22

HEADQUARTERS . . . AFA Convention—Fontenelle Hotel. Ladies Auxiliary—Paxton Hotel.

REGISTRATION FEES . . . AFA Members—$15.00. Ladies—$15.00. Non-Members—$20.00.

MEDICS REUNION . . . Brig. Gen. Lloyd E. Griffis, Chairman, Hq. SAC, Offutt AFB, Omaha, Nebr.

CHAPLAINS REUNION . . . Chaplain John C. W. Linsley, Chairman, Hq., SAC, Offutt AFB, Omaha, Nebr.

SEE PAGE 65 FOR ROOM

AFA Convention

THERE are big things in prospect for members and friends of the Air Force Association in Omaha, August 19-22. That's when AFA's 1954 Convention and Reunion is slated. Mark the dates on your calendar. Plan your vacation for that time. Bring your family. Here's a rundown on the program, listing the events—both business and pleasure—that'll make your stay in Omaha worthwhile!

THURSDAY, AUGUST 19

10:00 AM	AFA Directors Meeting	Fontenelle
12:30 PM	AFA Commanders Luncheon	Fontenelle
3:00 PM	Opening Business Session	Fontenelle
8:00 PM	Second Business Session	Fontenelle

SATURDAY, AUGUST 21

9:00 AM	Third Business Session	Fontenelle
12:00 N	Unit Reunion Luncheons	
2:00 PM	Final Business Session	Fontenelle
6:00 PM	Tour of Boys Town	
7:00 PM	Airpower—Awards Banquet	Boys Town

FRIDAY, AUGUST 20

9:15 AM	Airpower Symposium	Fontenelle
12:30 PM	Symposium Luncheon ($6.25)	Fontenelle
	Ladies' Fashion Luncheon	Paxton
2:15 PM	SAC Briefings	Offutt AFB
7:00 PM	Reunion Cocktail Party	Peony Park
7:30 PM	Western Barbecue	Peony Park
9:00 PM	Airpower Ball	Peony Park
10:00 PM	Hollywood Wing Ding	Peony Park

SUNDAY, AUGUST 22

10:00 AM	Airpower Brunch	Fontenelle

WESTERN WING DING

Eight-hour reunion at beautiful Peony Park . . . outdoor western barbecue . . . Airpower Ball.

NIGHT FIGHTERS REUNION

Mr. Gil Nettleton, Chairman, Northrop Aircraft Co., Hawthorne, Calif.

AIRPOWER—AWARDS BANQUET

Tour and dinner at world-famous Boys Town . . . Speaker—the Hon. Harold E. Talbott.

UNIT REUNIONS . . . Business and social get-togethers by members of wartime Air Force units and friends.

Convention Chairman Art Storz stages a preview of the steak barbecue that will highlight the Wing Ding at Peony Park.

RESERVATIONS

LET'S HAVE YOUR JET BLAST

In "Jet Blasts" you can sound off on any subject you want. Each month we'll pick the letter or letters we feel will interest our readers most and pay $10 for each one printed. Please keep letters under 500 words.—The Editors.

BULLETS AREN'T THE ONLY ANSWER

In neglecting psychological warfare are we passing up the easiest, most effective method of overcoming our enemies?

The realization of the A-bomb and the nearness of the H-bomb have caused Americans to rest on their military laurels and write off the next war as "won." Atomic weapons, jets, rockets, electronic achievements, and a host of technological advances have made most of us lose sight of the basic item in any nation's resource stockpile—the human being.

Bombs cannot reproduce themselves as do starfish or trees or tigers or people. And bombs can't drop themselves on an enemy target. Planes still need human guidance and electronic devices are man-made, even in 1954.

Everything in warfare has a human brain behind it. Yet we spend billions learning how to build bombs while hardly a nickel goes for human research. We know how the A-bomb works, but we don't know how the individual works!

Psychological warfare is our most important type of warfare today, and our most neglected. There will be no hot war tomorrow if psychology wins the cold war today.

The best thing to date, along psychological warfare lines, was our offer of $100,000 to the first Red pilot stealing a Russian MIG.

It's not too late to start, and win, a psychological war. The Department of Defense should recruit the nation's top psychologists and psychiatrists. We should support them and finance them. In that way we will win the cold war. Our psychological efforts have been insufficient and too hesitant.

Many lines of attack have been suggested by people from all quarters. Some of these suggestions have received national attention in our leading magazines and newspapers. A few have been considered at the highest levels of our government. Fewer have been initiated.

Radio propaganda is not nearly enough. We should flood the USSR and its satellite countries with things people can touch and see. How to get them there can be arranged. Balloons have been suggested by several serious thinkers. Possibly there are other methods, equally as good or better.

Let the Iron Curtain people get their hands on Bibles, Sears-Roebuck catalogs, newspapers, magazines, candy, cigarets, stockings, lipsticks, razor blades, and a few of the millions of similar items we and our allies produce. Undoubtedly they'll want more.

The idea of creating chaos in the Soviet Union by dropping millions of counterfeit rubles has been offered. Let's try it. Can we lose anything by taking the offensive in a psychological war?

Americans and their leaders alike must remember—in spite of our tremendous technological gains, psychology, the science of the human mind, is our biggest and most effective weapon. Let's use it!

Bob Fuson
New Bern, N. C.

Measure of Dignity

The lot of the professional airman, soldier, sailor or marine is a pendulum, swinging from one extreme to the other. In time of war the general public and Congress bend over backwards to afford the serviceman every nicety. As the draftees go home and the fears subside, their motto becomes, "Nothing is too good for the serviceman—so that is what we will give them—*nothing*!"

During World War II, when most of us went into the service, we could look about us and be grateful that someone had at least made an effort to compensate for the more pleasant life we had left behind us. There were many facets of the new environment we didn't like, but we were fed well and clothed well, and *most important,* we were looked upon as an important part of society.

Some of us progressed in grade and received compensating pay increases. At the same time, however, the laborer who had managed to evade military service (including those honest and sincere citizens who were willing to serve, but unable to do so for legitimate reasons), demanded higher wages and better working conditions. His demands were met and industry increased prices to make up the loss. The next year labor sounded the same demand. Again their demands were met and again prices were raised. Labor again and again increased their demands and wages and prices skyrocketed! (We paid the prices; they received the pay raises.)

"Demand" is a word we can't use. If we could, what would we demand? Higher wages? Better living conditions? We can't use the word "demand." We deplore the word "beg." We've been praised and given medals for bravery. We've had statues and memorials built to our proud traditions; we are proud people, but if we would beg what would we beseech? Would we ask that we not be separated from our families for long periods? Would we ask that Congress recognize as a contract the conditions of pay and privileges which existed when we accepted a Regular status in the service? Would we ask that Congress and the public abandon the constant effort to degrade the professional soldier, airman, sailor and marine?

You may ask, "Why don't you get out?" To which we must reply, "In 1945 and 1946 when we made the decision to stay in the service we considered several factors. First, we accepted our commissions and warrants with the same trust and confidence in the government and people of the United States as they gave us. I sincerely believe that I have lived up to that trust and confidence. Often Congress has not! Secondly, we had given up our lives in civilian competition and had spent three or four years in a new field. We were told of the benefits of applying those years to the 'security' offered by a career in the service. We hesitated to waste those war years. Now, with eleven or twelve years of service, that factor is even more important. Third, many of us felt that another war was imminent. Some were actually patriotic, others practical. Why get out only to be called back? (That the war with Russia has not yet been fought is only because we had a competent force, capable of delivering effective weapons.) No, we cannot afford to get out. Yet, many of us are resigning despite the fact we can't afford to get out. The trouble is that many of those who are giving up in disgust are the *best* we have in the service."

What is the solution? Another war would solve the problem, but we who would be shot at first are the first to fight against this as a solution. Then what? These steps would help:

1. Give the enlisted man decent quarters in which to live, insuring some measure of dignity and privacy.

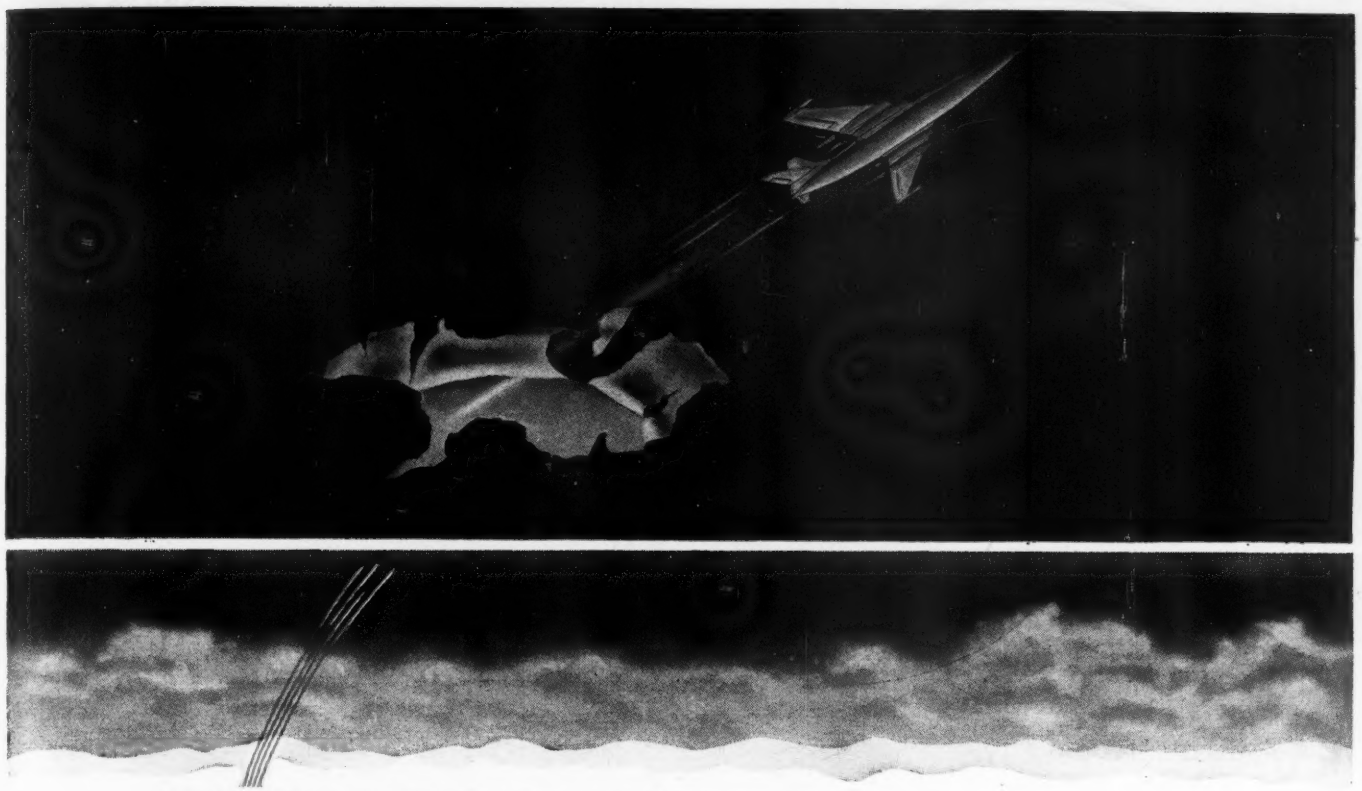
2. Congress and people in high places quit labeling all officers as incompetent ogres who maltreat the enlisted men. We are neither ogres nor crooks. We are better as a whole than any other group I know. We accept discipline, have high standards and generally adhere to them; we take drastic steps to eliminate from our ranks those who fail to meet those standards!

3. United States Chamber of Commerce and its members and other similar groups be less mercenary in demanding elimination of our PXs and Commissaries. They obtain plenty of our money as it is. Move a military installation from one community to another and you will see what I mean.

4. Congressmen quit attaching limiting riders on appropriations bills which abrogate the "contracts" they made with us and which whittle away at our pay and allowances. Specifically I refer to flying pay, rations allowances, etc.

5. Give increases in pay to service

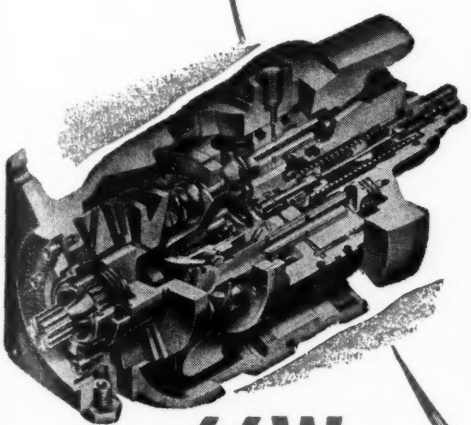
(Continued on page 61)



STRATOPOWER Is Ready for the Planes Which Will Break Through Today's Ceilings

The modern STRATOPOWER Hydraulic Pumps are ready and able to perform efficiently well beyond heights penetrated by piloted aircraft. They've proved it! In Rockets, Guided Missiles and under the simulated conditions of the ionosphere STRATOPOWER Pumps *pump!* They are built to perform at full efficiency and with complete dependability under the extreme conditions and variables imposed by projected speeds and service ceilings.

STRATOPOWER Pumps draw fluid from unpressurized reservoirs to sustain system pressure at altitudes where other pumps, dependent upon pressurized reservoirs, would be unable to supply system demands. Thus, they afford that vital added safety factor for high altitude operation . . . system actuation is assured, even though reservoir pressure may be lost.



SERIES 66W

PRESSURE COMPENSATED HYDRAULIC PUMPS

Designed to simplify hydraulic systems and to render the exacting control of such circuits more dependable. The range of models in these variable delivery pumps includes sizes delivering from 2 to 10 gpm at 1500 rpm with operating pressures to 3000 psi and speeds to 4500 rpm.

There is a STRATOPOWER Hydraulic Pump to provide the efficient source of fluid power for your requirement. Write for full information today.

WATERTOWN DIVISION
THE NEW YORK AIR BRAKE COMPANY
STARBUCK AVENUE • WATERTOWN • N. Y.

WATERTOWN DIVISION
THE NEW YORK AIR BRAKE COMPANY
750 Starbuck Ave., Watertown, N. Y.

Please send me full information on STRATOPOWER Hydraulic Pumps.

Name_____

Address_____

City_____ Zone____ State____

RAYTHEON

the GIANT *that makes* MIDGETS

Ability to think big about miniaturization problems is only one of the many talents that has set Raytheon apart in the field of electronics. It is an example of how Raytheon is serving the current needs of the Armed Services while paving the way for new and better developments.

Not all Raytheon products are small but all benefit from Raytheon's broad experience with miniaturization. Raytheon pioneered in the development of reliable miniature vacuum tubes, now leads in the production of subminiature tubes, germanium diodes and transistors. Miniature magnetic components are another example of Raytheon's unique ability to pack perfection into incredibly small units.

Raytheon has also pioneered in the application of miniaturization techniques to complete equipments. The benefits are unmistakably reflected in the compact design, trim appearance and servicing ease of *all* Raytheon products which include radar, sonar, communications equipment and other types of electronic equipment used in all branches of the Armed Services.

RAYTHEON

Excellence in Electronics

RAYTHEON MANUFACTURING CO.

CONTRACTORS TO THE ARMED SERVICES

WALTHAM 54, MASSACHUSETTS

personnel equal to pay increases granted in industry.

6. By these steps and by others give us a place in society somewhere above that of the ditch digger. Our present niche is indeed well below him in the minds of most of the American people!

Maj. Warren D. Johnson
Omaha, Nebr.

Morale Not For Sale

A great amount of comment has been made in the past year about service morale, officer and NCO prestige, and attractiveness of the service as a career. The number one panacea being advanced to better all of the above items is more pay. Certainly personnel of the Armed Forces are entitled to a decent standard of living but this in itself will never build truly good morale or increase prestige. Such things cannot be bought. A hired soldier, mercenary, serving merely for pay, has never and never will prove his worth. President Eisenhower reiterated that fact when he said in his State of the Union address that "pay alone will not retain in the career service of our Armed Forces the necessary numbers of long-term personnel."

The Marine Corps has been criticized for encouraging its officers to carry a swagger stick on appropriate occasions. The Marine Corps does not say that swagger sticks or such other impedimenta is the answer to attracting high quality personnel and a means of increasing morale. It is but one small step in the direction of instilling in its officers a command bearing. Nothing is to be gained by trying to disguise the identity of an officer and reduce all to a state of anonymity. The Doolittle Committee after World War II tried this with disastrous results.

The point is that to build morale and prestige we need more leadership, tradition, pageantry, ceremony, and in plain language, color. These things give a sense of pride, a connection with the past, and a will to make the organization better in the future. Mr. Hanson Baldwin in his very timely article suggested that we bring back the bands, the parades, the tradition to help restore pride in one's outfit.

Our swagger-stick critics say that we are archaic, are resorting to outmoded pageantry, and have our heads in the sand when we indoctrinate our personnel with the traditions of the past in this atomic age. Maybe so, but let's take a look at the record. The Marine Corps reenlistment rate is higher than any other service—July of this year will find a Corps of 100 percent volunteers, and a sufficient backlog of officer applicants for regular commissions now exists so that they can be selected on a very competitive basis. These things were not bought with pay alone. Since time im-

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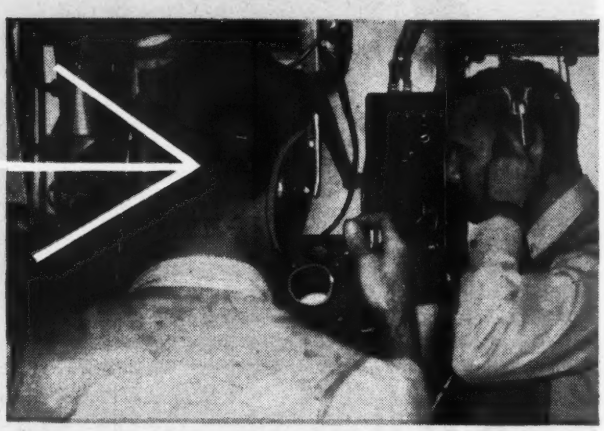


HUNTERS IN THE SKY!

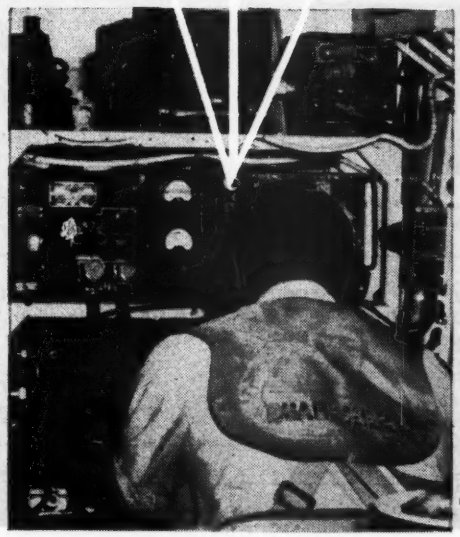
By remote control . . . seeking out and tracking the enemy target; pinpointing it unerringly for the kill . . . all through the modern marvel of electronic devices. Principal components of such devices are the magnetic units, elements of which are provided by Magnetic Metals Company in mass produced precision made magnetic core parts.

MAGNETIC METALS COMPANY

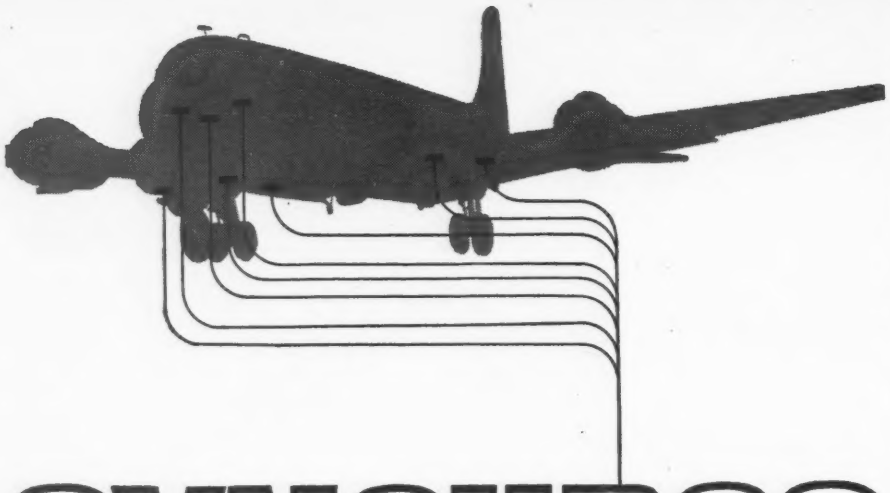
Soft Iron and Alloy Cores and Shields

21ST & HAYES AVENUE • CAMDEN 1, N.J.

MASS PRODUCED
PRECISION MADE



OFFICIAL U.S. NAVY PHOTO



SYNCHROS

Nerve ends for sky giants!

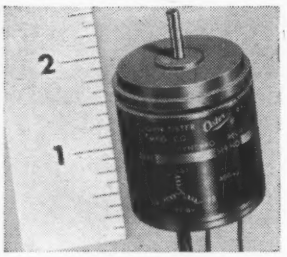
Rotors of these super-sensitive synchro torque transmitters duplicate or interpret the rotation or position of other rotors in remotely placed counterparts. In this way they give accurate, visual information on the action or angle of control surfaces, gear, fuel flow, auxiliaries, etc.

They are widely used in closed loop control systems where they demonstrate the precision quality of Oster Avionic Products.

They conform to military specifications for altitude, high and low temperature, life, shock, vibration, humidity and fungicidal treatment.

You can depend on Oster quality in rotating components for automatic control.

Insure dependability... specify Oster®



OSTER lightweight Synchro Transmitters, type 2G Accurate to .25° or less, in angular definition. Has many applications in the avionics industry, where angular or linear position indications must be accurately interpreted.

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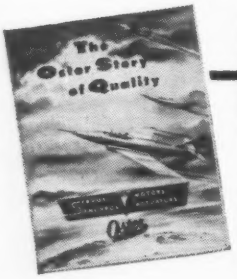

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Lt. Col. J. R. Anderson, USMC
Colorado Springs, Colo.

Security

In many military and industrial establishments it is all too obvious that almost no one has received more than the most rudimentary introduction to the problems of safeguarding the nation's secrets or instructions on how to handle classified material.

No great knowledge of security practices is needed to observe that in many offices the right hand does not know what the left hand is doing. New employees are usually given a brief rundown (usually an afterthought) on practices used in that particular office and then the matter is dropped. No effort is expended to give them broadness of view or even a notion of the importance of security precautions. This poor orientation often leads to inconsistences, loopholes and even personal misfortunes.

Usually security measures in an office are established by a competent security officer and then allowed to be run by untrained personnel with only a very hazy notion of security measures.

In one office, under constant guard, a worker was reprimanded for leaving a restricted document (before they abandoned that classification) on his desk; while in another similarly protected location confidential material was never locked up. In another agency a control unit presumably kept track of every piece of secret material in the building by an elaborate logging system.

However, one department made multiple unregistered photo copies of these documents for their own use, thereby rendering the system ludicrous. In another department, analysts were regularly engaged in summarizing information from intelligence documents on an index card, in direct violation of an existing order to the contrary. These few examples could be multiplied a hundredfold daily.

The rules governing the handling of classified matter are couched in general terms so as to be flexible enough to cover the great variety of situations which arise. This is an admirable objective, but the net result has been chaos.

Better orientation for new employees would produce a more uniform handling of security. Because the subject is general, yet ramified, seminars would offer an excellent training method. Much of the haze overhanging security practices could be cleared by improved training.

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The READY ROOM

RESERVE AND AIR GUARD NEWS

Air National Guard strength has jumped to 47,000—highest in the history of the organization, and some 44,000 of these officers and airmen will take part in **field training** beginning this month.

The field training exercises will continue through August at **eight sites:** Boise, Idaho; Casper, Wyo.; Alpena, Mich.; Syracuse, N. Y.; Reading, Penna.; Otis AFB, Mass.; Savannah, Ga.; and Gulfport, Miss.

Of the 87 tactical squadrons, 49 will train in jet fighters, according to Brig. Gen. Winston P. Wilson, chief of the Guard Bureau's AF Division.

Notes on the back of a Form 175 . . . ANG's 81 **replacement training** squadrons, scheduled to be organized in the fiscal year beginning July 1, probably will be phased in at the rate of 20 each three months.

* * *

The Pentagon study which recommends the Reserve **structure of the future** has been forwarded to the Office of Defense Mobilization. It will be screened by ODM, then by the National Security Council, the President, and eventually will wind up in Congress.

Reliable reports indicate that the new **AF Reserve Center program,** now in operation (see "What Gives With the Reserve?", April AIR FORCE), is tailor-made for the recommended AF Reserve.

* * *

Some AF Reservists are urging a change in the policy which prevents granting **mobilization assignments** to Department of Defense employees. AF reasons such assignments would be tantamount to giving a Reservist double compensation for the same job. **Present policy** permits these Reservists to receive mobilization designations to a command or AF activity.

Air Guard Open House: The public meets the ANG's 116th Fighter-Bomber Wing, Dobbins AFB, Ga., and sees air show.

Air Reserve Open House: Opening of the new Air Reserve Center takes place at Lambert-St. Louis Municipal Airport.

RESERVE YOUR ROOM NOW FOR AFA'S CONVENTION AND REUNION

CONVENTION HEADQUARTERS—FONTENELLE HOTEL

Two headquarters hotels have been reserved for AFA's 1954 meeting in Omaha. The Fontenelle is Convention Headquarters, and the Paxton is AFA Ladies Auxiliary Headquarters. Convention delegates and visitors will stay at both, as neither is large enough to house the entire Convention. Send your room request to the hotel of your choice. State whether you want air conditioning.

LADIES AUXILIARY HEADQUARTERS—PAXTON HOTEL

Rates	Single Room	Double Room	Twin Room
Fontenelle	$5.50-10.00	$9.00-12.50	$10.50-14.00
Suites: 1 Bed Rm.: 25.00-32.00		2 Bed Rm.: 36.50-43.50	
Paxton	5.50-9.00	7.00-9.75	8.00-10.75
Suites: 1 Bed Rm.: 16.00-17.00		2 Bed Rm.: 26.00-27.00	

AIR FORCE ASSOCIATION CONVENTION ROOM RESERVATION REQUEST FORM
August 19-20-21-22, 1954

(Please Print)

NAME_____

ADDRESS_____

CITY_____ STATE_____

ARRIVAL DATE_____ HOUR_____

DEPARTURE DATE_____ HOUR_____

NAME OF PERSON(S) SHARING ROOM:

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*Room available at rate nearest that requested will be assigned.

MAIL DIRECTLY TO:

Reservations Manager
(Name of hotel of first choice)
Omaha, Neb.

(Please list two choices of hotels)

CHOICE: HOTEL DESIRED

First_____

Second_____

TYPE ROOM DESIRED

☐ Single ☐ Double ☐ Twin

☐ Suite—Number of Bedrooms_____

Desired rate per day: $_____*

☐ Desire Air Conditioning

Meet AFA'S Air National Guard Council

Washington, D. C.'s Col. Willard W. Millikan heads the thirteen-man group Air Force Association has set up to coordinate Air Guard plans and policies

A thirteen-member Air National Guard Council has been set up in AFA to coordinate ANG plans and policies. This council parallels AFA's National Air Reserve Council, giving AFA complete coverage on the principal civilian components of the Air Force. In announcing the council, AFA President George C. Kenney said its formation recognizes the "importance of the Air Guard to our present and future security." Meet Chairman Millikan and his associates:

Willard W. MILLIKAN

Alexandria, Va. Iowa native; War II triple ace. Commands D. C.'s ANG 113th Fighter Wing. In civilian life is Washington representative of aviation products division, Goodyear Tire and Rubber Co. Set transcontinental jet speed record last January.

Bernard M. DAVEY

Atlanta, Ga., by way of Chicago. Principally known as "Bud." Flew B-17s with 8th AF in WW II; later served with ATC and Training Command. Now commands Georgia's 116th Fighter-Bomber Wing. Command & Staff School graduate and served active duty tour as maintenance officer in AF division of National Guard Bureau.

Joseph J. FOSS

Sioux Falls, S. D. First fighter pilot in WW II to equal Eddie Rickenbacker's WW I record of 25 victories. With the Marine Corps. Won Congressional Medal. Organized South Dakota Air Guard in 1946. Presently Air Chief of Staff in that state. In civil life runs Foss Motor Co.

Dale J. HENDRY

Nampa, Idaho. Became air technician with Boise's 190th Fighter Squadron in 1949. Served on active duty with squadron during Korean war in Georgia and California. Presently sergeant major of Idaho ANG, and held similar position for nationwide ANG gunnery exercise at Gowen Field, Boise, last fall.

Lloyd L. JOHNSON

Lincoln, Nebr. Flew 99 missions in WW II with 81st Fighter-Bomber Group in France. Knocked down German jet ME-262. Joined Nebraska Air Guard in '49; later earned degree in education from Nebraska U. Currently flight leader in Nebraska's 173d Squadron.

George D. McMORRIES

Dallas, Texas. Joined 136th Fighter Group in 1947. Served with outfit in Japan and Korea. Member 14th Air Force Committee on ANG Policy since 1952. Backgrounded in operations and inspection; presently ground supervisor for 136th. Has served with Air Force since 1940.

Cornelius H. MURPHY

Bangor, Maine. WW II service in Pacific. Joined Maine's 101st Fighter Wing in 1947 and still an active member. Went on active duty with wing in 1951. Senior aircraft mechanic, full-time with Maine ANG. Brings to Council long experience in aircraft equipment.

Alfred C. SCHWAB, Jr.

St. Paul, Minn. Won wings in '42. Recon squadron CO in Italy in '44. Joined Minnesota's 133d Group in 1946. Director combat operations in ADC's 31st Air Division during Korean war. Now commands 133d Group, winning promotion to colonel last December. In civilian life, ad manager for Dietene Company.

William W. SPRUANCE

Wilmington, Del. Graduated Princeton, 1939. Learned to fly in 1940. Finished cadets in '43. With Combat Cargo, CBI, in 1944. Later shifted to ATC and flew "Hump" run, had 1,000 hours overseas Form 5 time. Now Chief of Staff for Air in Delaware, where joined ANG in 1946 as commander of 142d Weather Detachment. Senior pilot, green card. Dropped from major to captain to get in ANG. Ran Guard tow target project for ack-ack boys in 1950.

Arthur R. STELLJES

Forest Hills, L. I., N. Y. Flight commander in New York's 137th Fighter Squadron at White Plains. Fighter gunnery instructor in War II. Lawyer, having done graduate work in aeronautical law at NYU. Has 2,500 hours, prop and jet, but principally in fighters.

Charles W. SWEENEY

East Milton, Mass. Executive Officer, Massachusetts' 102d Fighter Wing. Member Section 5 Committee on ANG and Reserve Policy. Flew B-29 which dropped A-bomb on Nagasaki. Also on Hiroshima A-bomb strike mission. Won wings in 1941. Joined Mass. ANG in 1947. Performed some early experimental work with XB-29.

Richard T. SYKES

Van Nuys, Calif. WW II P-38 fighter pilot in Mediterranean. After war flew B-26s in California ANG out of Burbank. Lawyer; recently completed active duty tour in Legislative and Liaison Division of Hq. USAF. Completed law school at George Washington U., in D. C., finishing at top of class. Back in California ANG with 146th Fighter Wing and has hung out law shingle. Airpower enthusiast of first order.

James A. WESTON, Jr.

Columbia, S. C. Graduate Airborne School in '43. Joined S. C. ANG in '50; became first sergeant of 157th Fighter Squadron. Served with squadron on active duty for Korean emergency. Chairman, Airman's Advisory Council, Lawson AFB, '51-'52. Helped South Carolina AG organize that state's Guard NCO Association. Still top-kick of 157th.

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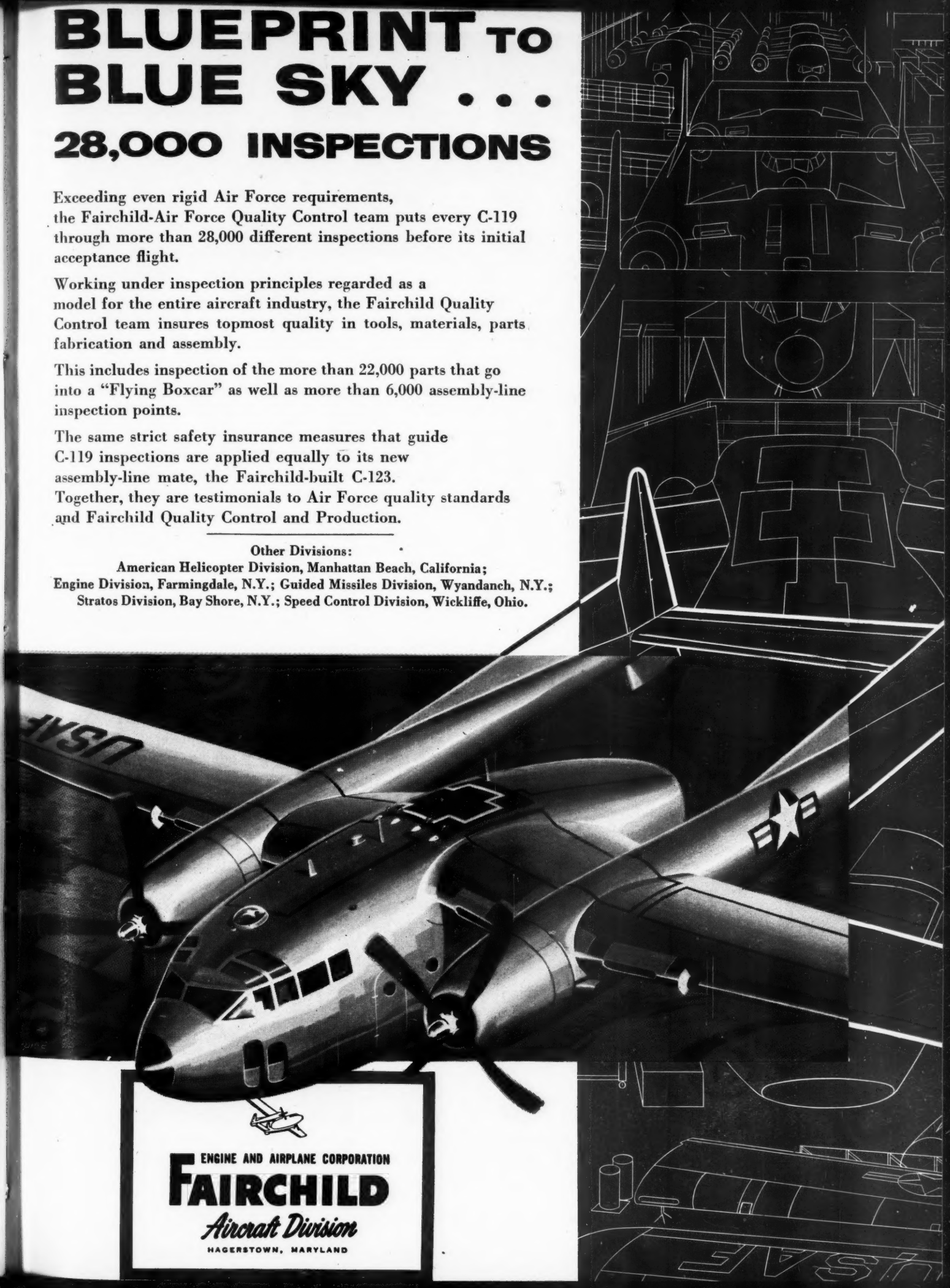

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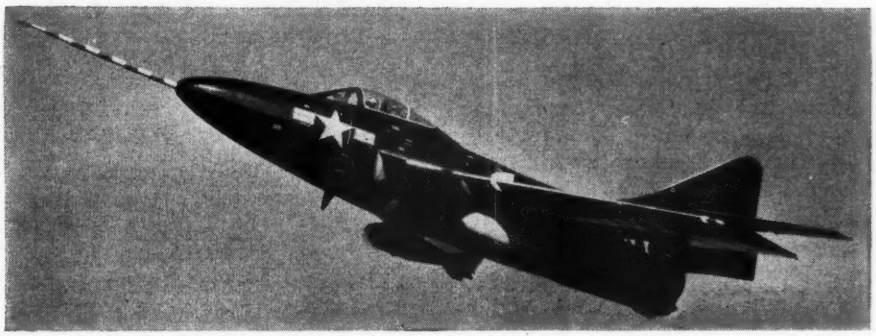
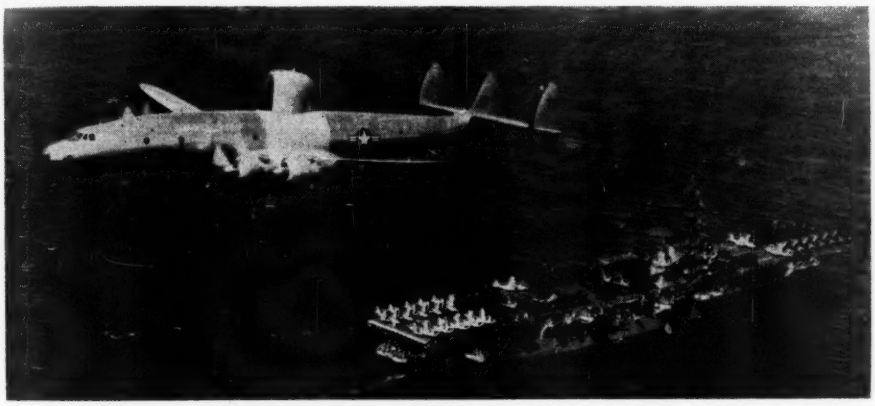
TECH TALK

The first photo of the Navy's new sky-and-sea fighting team, below, shows the radar-packed **Lockheed WV-2** (USAF RC-121C) and the carrier-based fighters it could direct into battle when the "airborne eye" of the Super Constellation electronically spots danger ahead of the fleet. Thirty-one men and six tons of radar gear fill the WV-2. The Navy's first has been delivered at Pearl Harbor and assigned watchdog duty in the Pacific.



The Grumman F9F-6 Cougar, Navy's first sweptwing jet in squadron service, shown toting two 1,000-lb. bombs. The Cougar also has four 20 mm cannon.

Want to fly to Europe on a super-economy, budget plan? Hook onto a "**Moby Dick**" high-altitude balloon. One launched in California this winter, says ARDC, landed 52½ hours later in Spain. It averaged 120 mph for the 6,250-mile flight and set a **new distance record.**

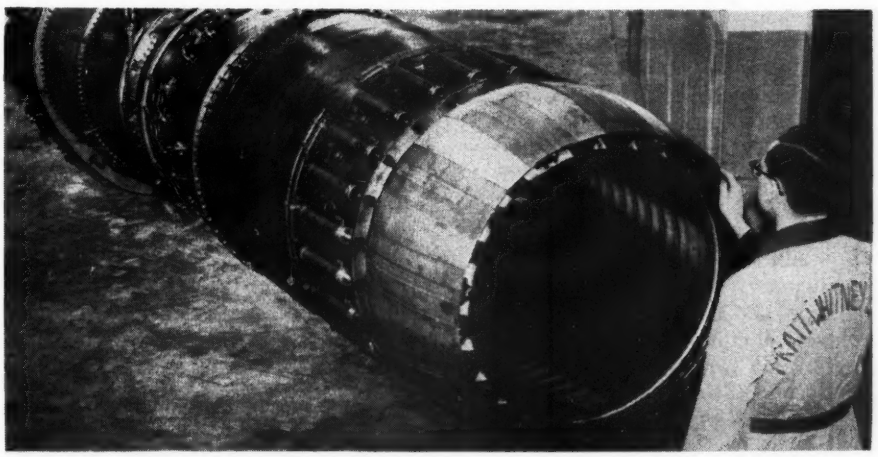


Navy's new sky-and-sea fighting team. A WV-2 long-range, high-altitude radar plane, now on watchdog duty in the Pacific, over the USS Oriskany.

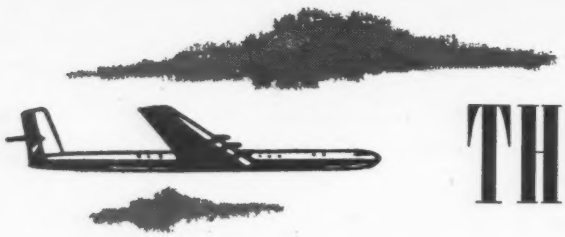
Boeing's **new jet tanker-transport** was rolled out of its plant near Seattle in May, two months ahead of schedule, and is expected to fly late this month. In the 550-mph class, the new plane, as a commercial transport, could span the nation non-stop in less than five hours, or cruise from New York to London in less than seven. A possible **military application** would be as a high-speed tanker for jet air fleets. The new jet is 128 feet long, with a span of 130 feet and a tail height of 38 feet, three inches.

The latest addition to a well-known Air Force family is **Republic's YF-84J,** which has made its first flight at Edwards AFB, Calif. Like the F-84F Thunderstreak, now being delivered to USAF wings, the J-model can carry **the A-bomb.** It has a GE J-73 engine and redesigned air intake duct, fuselage, dive brake area, and internal systems.

The trouble with jets isn't so much getting them started; it's getting them stopped. Piston-driven aircraft had pretty much the same problem until the reverse-thrust propeller was introduced in 1946. Reversing thrust on props cuts down the runway distance needed by about half. A Jet Age equivalent of reverse thrust became that much more necessary, since jets land at much higher speeds than "conventional" planes. Drag parachutes have been used with good results on jets but require skilled technicians to repack them once they've been popped. Now at least two **jet-braking systems** are in prospect. One, a variable area exhaust nozzle developed by the **Marquardt Aircraft Company,** promises up to thirty-five percent reverse thrust. The unit, company engineers claim, will be able to trim in flight to an area that will achieve minimum specific fuel consumption for a given cruise thrust requirement. This presumes increased range and, according to Marquardt, fuel savings that will more than pay for the added weight (about 100 pounds) of the nozzle. Another jet-brake is **Boeing's clamshell "W"** type, which consists of two curved cowling sections that can be moved into place in the jet stream by an actuator and push rods. Then baffle plates deflect the blast forward along both sides of the engine nacelle (on a podded engine, such as the B-47 has), reversing as much as fifty percent of the engine's thrust. Boeing engineers point out that the clamshell device, one of five types of thrust reverses the company has been investigating, works equally well for multi-engine bombers or single-engine fighters.—END



That extra kick makes the difference. A Pratt & Whitney employee checks the afterburner of a J-57. The turbojet powers the F-100, F-102, and F4D.

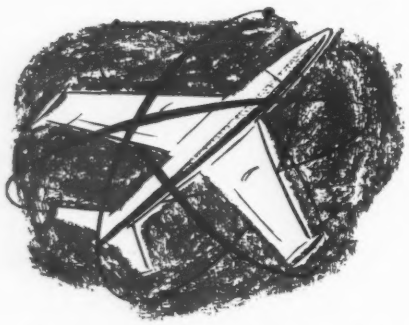


THE NEXT 50 YEARS O

These six articles are condensed from speeches made at the AFA California Wing Convention in Santa Monica, in April, at the "Future of Flight" Symposium.

NUCLEAR AIRCRAFT

Hall L. Hibbard
V-P, Engineering, Lockheed



Nuclear power may be used in several ways. The heat source may be used to drive a turbojet engine, a turboprop engine, or a rocket engine. In any case the reactor supplies the heat which would normally result from burning chemical fuel.

The method by which the heat is transferred is important and determines complexity and type and arrangement of power plants. Various methods may be utilized. Each method has many variations, and one of the principal tasks in the field today is the continued, careful consideration of all such schemes so that power plants finally built will represent the best and most promising approaches to the entire problem.

Nuclear radiation is what forces us to use shielding. The usual concept of reactor shielding is called a "unit shield"; that is, all of the shielding necessary to reduce the radiation to a level tolerable by the human body is placed directly around the reactor power. Unit shielding is a sound approach, but it is also very heavy. A lighter total shield weight is possible if only some of the shielding is put on the reactor and the rest is placed around the crew at the flight station. This is known as "divided shielding." Divided shielding will be most advantageous when the flight crew is concentrated in one area and, further, when that area is fairly small, since the occupied quarters must be completely surrounded by shielding.

The popularly-recognized advantage accruing to a nuclear-powered aircraft is its almost unlimited range. However, another and equally significant characteristic is *its almost unlimited endurance, regardless of speed!* This is, perhaps, a more basic definition, since range is, after all, only endurance multiplied by speed.

The success of many military aircraft missions is wholly or partially coupled with endurance only; for example, search, reconnaissance, or patrol missions. High speed may actually be a handicap due to reduction of search equipment capability with increased flight speed. Again, many missions require loitering for rendezvous with other aircraft, or prior to landing in bad weather. Here, too, speed and range pay no dividend whatsoever, but *endurance* does.

Thus, the answer to our first question seems to be that any aircraft mission in which endurance is important, and, particularly, when *high-speed* endurance is desired, lends itself to nuclear power.

Our second question was: How can we decide that an apparently attractive application will prove, *in fact*, to be desirable, practical, and economical? This problem is difficult and complex. The measure of effectiveness is usually different for every type of mission. One might say that the most probable form of a "measure" for military aircraft systems is some ratio of job accomplished to expenditure to accomplish it.

Such analysis for nuclear-powered aircraft is further complicated by virtue of the newness of the concept. If we had such airplanes flying today we would be able to base many of our estimates on experience. Lacking this it is necessary to estimate, relying wherever possible on parallel chemical aircraft features and on somewhat limited and noncomparable experience with present fixed ground reactors.

Our third question was: What physical features and characteristics of a nuclear-powered aircraft may we expect to be similar to today's airplanes and what features are likely to be different? Particular nuclear aircraft designs may prove to have novel and radical features compared to today's products, just as tomorrow's chemical airplanes may have some consequential differences. But in general exterior appearance, no particular differences need be expected. Engine noise will probably be about the same at the same power level.

Insofar as aircraft size is concerned, I expect that nuclear aircraft will be no larger than some of today's large military aircraft, and their gross weights will probably be no greater. They may prove, in fact, to be actually smaller and lighter. Because so much of their weight is in dense, concentrated shielding material, they should generally prove somewhat smaller *for a given gross weight* than their chemically-powered counterparts.

A summary answer to our third question thus might be: No particular significant differences in outward basis arrangement, appearance, or size.

Our last question permits me to do a little crystal-gazing. What are the prospects, and what prognostications may we make, with respect to the over-all future of nuclear-powered flight?

I do not see all of the answers. But I have been similarly situated before and have seen the competence of this nation's scientists and engineers proceed with amazing rapidity. I am placing my confidence in a similar rapid massive advance in nuclear power plants for aircraft.

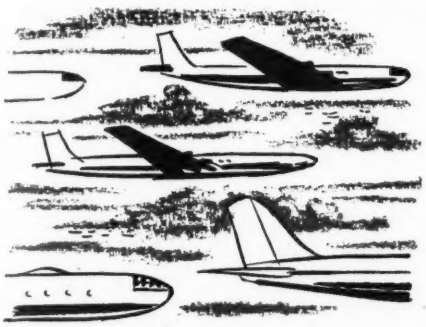
I expect to see nuclear-powered military aircraft in being within ten years. I imagine that the first generation of these will be strategic bombers having supersonic speed capabilities for truly intercontinental missions. I expect that close on the heels of the first generation of bombers will come nuclear-powered military aircraft for other missions, such as patrol and search, reconnaissance, and, a little later, logistics carriers or cargo transports.

S OF FLIGHT

When some of the best crystal balls in the business are polished up, you get such startling predictions as atomic-powered aircraft in the next ten years, then space flight

MILITARY AVIATION

Edgar Schmued
V-P, Engineering, Northrop



The first ten years of the coming fifty years are easy to predict. The reason for this is the long lead time which is required to develop new ideas to the production stage. During this period we shall expect transonic bombers powered by turboprops and having longe-range capabilities (intercontinental) and transonic bombers with limited supersonic capabilities powered with turbojet engines and having a shorter radius. The combat altitudes will be above 50,000 feet.

Fighters will be in the supersonic range with better than 50,000 feet altitude and with an accent on long-range or extended combat radius. Armament will include guns, rockets, air-to-air target-seeking missiles. Fire control systems will be radar controlled and essentially automatic, coupled with navigating devices that can be ground controlled and vector the fighter into the attack.

The guided missile will get into its own during these first ten years. Missiles will appear that will have very high speeds and short duration of flight as well as missiles that have very high altitude capabilities and longer durations of flight and attain a high degree of invulnerability by being able to attain high altitude or speeds. Missiles will be powered by turbojets, ram jets, and rockets. The accuracy of guidance systems will be perfected. Ballistic, rocket-propelled missiles will be able to operate without guidance systems.

One of the most severe problems we are facing during these first ten years is the temperature rise with increase in speed. A new material, titanium, will become available which will permit extending the speed range, or the use of high temperature steel will be required to push the speed range further up and even ceramic materials may have to be used. At a certain speed range even this will be insufficient and cooling must be provided.

The next ten years or second decade will very likely see some of the just mentioned developments reach the production stage. The development of military aircraft will very likely go into two directoins; one in very high speed and the other in very high altitudes, with overlapping areas.

For logistic purposes, we will develop large fleets of military transports which will be subsonic and powered by turboprop power plants. For very specific purposes there will be turbojet-powered transport with supersonic capabilities. Bomber fleets of a certain type will be able to cruise supersonically over a very large portion of their cruising range especially over enemy territory. Other bombers will cruise at altitudes well above 60,000 feet and attain a high degree of invulnerability by high-altitude flight using favorable air currents to extend their operating range. They will be equipped with automatic guidance systems, thereby eliminating bomb sights as we know them today.

Fighters will be larger with an accent on combat radius, altitude, and supersonic performance. Certain bombing missions will be flown by fighters which will be able to carry nuclear weapons.

Short-range bombers as well as long-range fighters will appear with ramjet propulsion or mixtures of ramjets and turbojets. New fuels will be available of much greater potential, coupled with materials which will withstand the higher temperatures these new fuels will provide. The much greater power will permit very short or vertical take-offs.

Although intercepting missiles will be vastly improved in accuracy, altitude, performance, and reliability, the art of counter-measures and jamming will make great strides and largely offset performance gains.

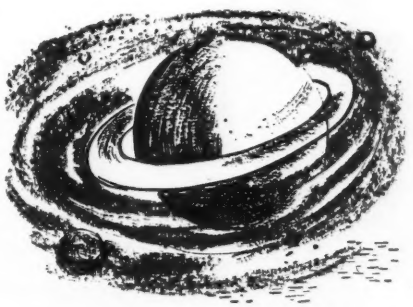
At the end of the second decade we shall find considerable use of nuclear power in manned aircraft and missiles. The balance between manned aircraft and missiles will have shifted toward the latter.

The third decade will find a pronounced shift toward missiles in the combat field with military transports remaining in the manned aircraft field. There will be still an appreciable percentage of bombers and fighters, although the performance of these will match the performance of the missiles. The perfection of nuclear power may see a new emphasis on manned aircraft.

The most difficult to predict are the last two decades of the next fifty years. It must be assumed that nuclear power sources will be so abundant that the strategic missile inventory will be almost exclusively powered by nuclear power. The short-range missile will operate on more conventional fuel and the manned combat airplane will have disappeared from our military inventory.

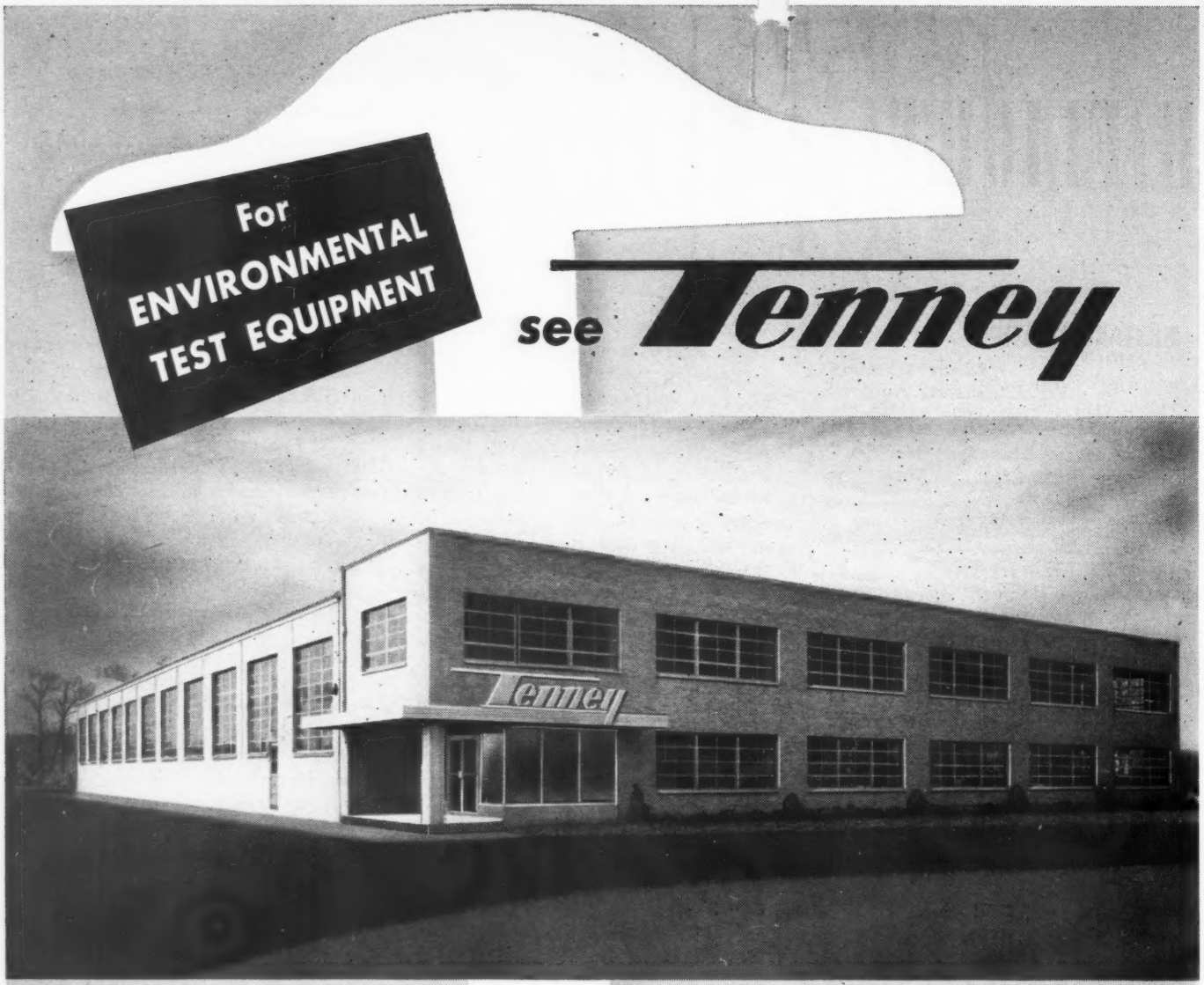
SPACE FLIGHT

Dr. Heinz Haber
Professor, UCLA



We are approaching a point where far-reaching flights beyond the limits of the atmosphere must be considered the challenge of the next fifty years of flight. Although nobody seriously considers equipping an ex-

(Continued on page 73)



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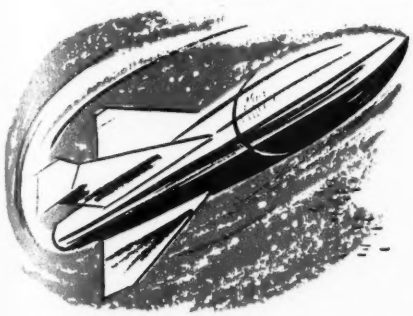
pedition to the moon, the future problems of space flight are acutely felt today in the operation of our modern rocket airplane. We would be grossly mistaken if we would reckon the conquest of space in terms of sheer distance. Space flights must be measured in practical terms. More than two years ago the Douglas 558-II's pilot launched his craft to a height where less than four percent of the earth's atmosphere separated him from the emptiness of space.

Before rocket vehicles can routinely be operated in space the problem of aerodynamic heating must be solved. It is true, the effects of aerodynamic heating are lessened at greater altitudes, because air of lower density transfers less heat to the ship. If we intend, however, to fly much higher than today, we will find it necessary to fly much faster in order to derive enough aerodynamic lift from the attenuated air of the upper stratosphere. At this stage of the art it looks as though our ship becomes too hot before it is able to attain a speed great enough for staying aloft. Beyond an altitude of 100,000 feet sustained flight becomes difficult. There an airplane is either too slow, too hot, or both. This conflict is resolved only at heights in excess of 400,000 feet, where the air becomes so thin that even orbital speed does not produce enough aerodynamic heating to become dangerous.

As high-altitude flight gradually blends with actual space flight, we must learn to protect the human operator of the rocket vehicle against the various hazards of space: lack of breathing air and atmospheric pressure, overheating of the craft from solar radiation, the possible dangers from cosmic radiation and from meteorites, and the possible ill effects of weightlessness.

ROCKET PROPULSION

S. K. Hoffman
Chief of Rocket Lab, No. American



As developments continue, there is every reason to expect that unguided and guided missiles, using rocket engines, will be increasingly utilized to take over the functions of machine guns, artillery, anti-aircraft guns, and piloted combat aircraft such as interceptors and bombers.

Rockets are also used today in three different power plant applications in manned aircraft. I'm sure you're all familiar with the solid-propellant and liquid-propellant assist-take-off units which are designed to permit a heavily loaded cargo aircraft or bomber to take-off from a short field, or from a field at a high altitude.

Another type of rocket engine is in use today which is installed as an integral auxiliary unit on conventional jet-propelled aircraft. This super-performance rocket engine is to be used during the relatively short periods of time when superior performance is needed in contact with an enemy aircraft.

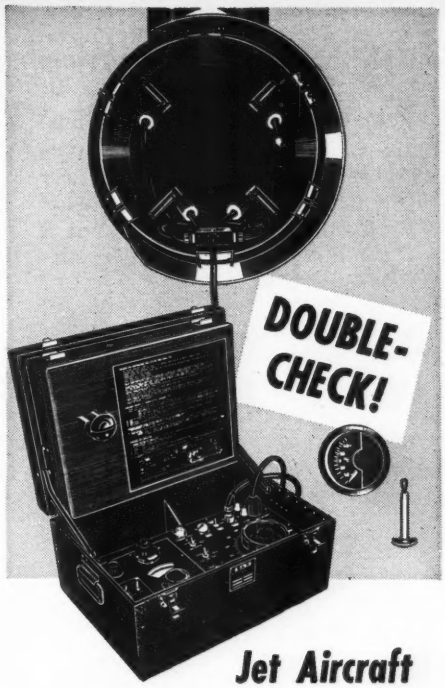
The third type is the fully rocket-powered aircraft, such as the German ME-163 and the Bell X-1. It is entirely feasible that the rocket-powered interceptor may find a prominent place in our stable of defensive weapons. With a rocket engine as the prime power source, an interceptor aircraft can have a phenomenal rate of climb and a service ceiling that is almost literally "out of this world."

The recent release of information concerning the Convair and Lockheed vertical-take-off fighters has excited a good deal of interest in this concept. These vertical-take-off fighters obtain their high thrust through the use of large, contra-rotating propellers, but for several years the concept of the use of what might be called a "super-ATO" rocket engine to equip a conventional propeller-driven or jet-propelled aircraft for vertical take-off has been seriously investigated in many quarters.

For such an aircraft, the rocket engine would be gimballed for directional control, and the thrust would be controlled by the pilot in the conventional manner. During the vertical take-off and landing, the aircraft would actually be balanced upon the thrust produced by the rocket engine. Once in the air, the aircraft would fly in the conventional manner. With vertical-take-off fighters and interceptors an air defense system would be much less vulnerable, since there would be no large installations that could be easily recognized and attacked. Any farmyard, any clearing in a wooded area would serve as a base of operations.

One might conjecture for hours about the technical possibilities of rocket propulsion in aviation's future.

(Continued on following page)



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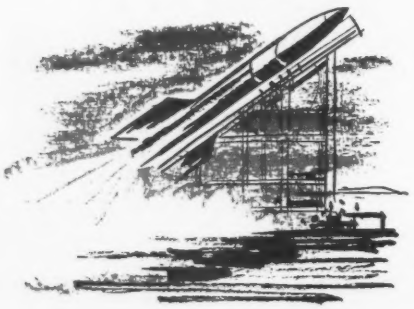
But I'd like to leave you one final question—perhaps a trivial one, though I'm sure some of you here might not think so: I wonder what the Air Force will be called when it no longer operates within the earth's atmosphere.

GUIDED MISSILES

Charles F. Horne
Mngr., Pomona Div., Convair



Guided missiles are a new field—both for industry and the armed forces. Their effect on the methods of warfare—only theoretical so far—is beginning to make itself felt throughout the military services. Missiles have become operational weapons and have to be reckoned with in planning future combat.

Let us go back to the closing months of World War II. It became apparent then to the military services that anti-aircraft artillery—even with the proximity fuze—was not enough to stop enemy bombers before they could do serious damage.

The need for the weapon engendered the need for a compact but rugged rocket motor, automatic pilot and guidance system. The nation had these three components, but they were bulky, delicate and unpredictable.

The big problem then became that of squeezing them into a missile fuselage—tiny by previous standards—that could carry a warhead at supersonic speeds. And they had to be made rugged enough to withstand the terrific shocks of sudden acceleration and maneuver.

The most brilliant scientific and engineering brains in the country were at work on the problem. Despite the fact that these men ate, slept, and thought nothing but missiles, it took model after model—change after change—refinement after refinement—before a dependable weapon was made.

And the fact that the weapon was dependable was still not enough. It had to be a weapon that lent itself to manufacture, for it had to be made in quantity.

The prospect of production brought many more problems and complications. Enough missiles had to be made to constitute an effective weapon—one that could be as dependably supplied as shells or bombs. Dollars had to be trimmed from the cost, but not so much that it reduced the missile's dependability. The prime consideration of any guided missile was, and still is, that it work perfectly the first time. There is no such thing as a flight test.

Quantity manufacture required storage for the finished missiles. And the missiles had to come out of the stockpile the way they went in—in perfect firing condition. Quantity production engendered the problem of magazines for the launchers. All these problems were met and mastered, and then came the post-production complications.

With missiles to use, there had to be an operational doctrine. This was primarily the military's problem, but it was the engineers', too. The doctrine had to answer the question of, now that you've got missiles, where, when, and how do you use them?

After where, when, and how, came the questions of who. Who was going to handle the missiles from factory to stockpile, from stockpile to magazine, from magazine to launcher and launcher to target? It takes months, and sometimes years, to train a team of men who can effectively use guided missiles as weapons. I do not mean that they must be engineers or scientists. Missiles are no more complicated—in use—than the fire control system of a Navy combat ship or the navigation and bombing system of an Air Force strategic bomber. But missiles are different, and the men who maintain and operate them must be specially trained.

With absolutely no intention of discrediting the scientists and engineers—since their initial efforts paved the way for a missile-in-being—we have now progressed to the point that no longer are we solely dependent upon them to operate, maintain, and fire effectively, the useful missiles we have today.

The fact that dependable guided missiles are becoming available to the armed forces sets up a course of action that has no precedent. Historically, no weapons system has ever been replaced by a new one in time of peace. It is in the nature of military men that they cannot put their complete trust in a weapons system that has not been proved in combat. It is ridiculous to suggest that since guided missiles are becoming available, the guns and bombers should be scrapped. No matter how good they look on paper, and in field tests, guided missiles cannot *now* supplant the proven weapons of warfare.

Rather, guided missiles will be introduced gradually into operating doctrine as complementary weapons systems.

AIR TRANSPORT

Arthur E. Raymond
V-P, Engineering, Douglas

It is now realized that a military air transport fleet must be maintained at all times and that the services must gear their operations to the mobility of air logistics.

In addition to the savings in the pipelines of supply resulting from such a policy there is the overwhelming military advantage of "getting there first with the most."

In at least two fundamental respects the future of civil transport aviation depends upon the military program—for development of its engines, and for assistance in establishing a quantity aircraft price.

The chances are that the future civil fleet will be divided into aircraft whose emphasis is on high speed and aircraft whose emphasis is on low cost. The first will be jet and the second turboprop.

Some of us think the real big expansion will be in air cargo. Here the potential is certainly high if costs can be markedly reduced. This can be done if the military services take the lead.

We can begin to see where commercial and military air transport may well move forward together, mutually assisting each other in development of equipment, ground facilities, airway and navigation aids, communications, operational procedure, service and maintenance practices, training, etc.

Thus future air transport will play an important dual role in maintaining peace and in building the commerce that relieves the stresses making for war and raises living standards everywhere.—END

Where's "Charlie"?

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Cessna Gives "Wings" to Army Words

When phone lines are cut . . . when field communiques are urgent, complicated or super-secret, the Army often depends on fast Cessna L-19's to swoop in and scoop up messages. L-19's are also used for observation, photography, equipment supply, military traffic control, even insect spraying. In fact, L-19's are almost as versatile as the highly trained Army aviators who fly them. Cessna has been building these rugged airplanes and delivering them to U. S. Armed Forces *on schedule* since 1951.

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Wire Laying at 70 m.p.h.!

Linking isolated units with command centers is a fast job for L-19's. Giant spools under the wings "play-out" wire over *any* terrain, faster than a mile a minute! Cessna visibility, low stall speed, 213 H.P. engine performance and short take-off and landing ability make this possible. And L-19's require less maintenance than any other Army airplane.

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Keeping Contact "Up"

When Army ground units are separated from each other by terrain obstacles or long distances that prevent radio contact, L-19's function as airborne radio stations, relaying messages from one group to another.

General Sweeney, military host to California Wing Convention, accepts top award for SAC from Mike Pisani. In foreground, Kenney and Terry Moore.

New California Wing officers include, from left, Merrill Levy, Secretary; Mrs. Dorothy Myers, Wing Auxiliary President; Cecil Howard, Commander; and Robert Kirby, Treas.

Kenney sounds somber warning about Russian capabilities in keynote address at California Wing Convention in April

AFA'S President, George C. Kenney, usually calls the shots as he sees them. He called a few in April, when he keynoted the AFA California Wing's annual Convention in Santa Monica. "The Red capabilities," Kenney said, "are greater than we think, and our capabilities of defense and retaliation are not as good as most of us think. The Reds today have the largest land force known to history. They have the largest air force in the world, and the equipment is excellent by any standards.

"We have been making A-bombs for nine years," he said. "Russia has been been making them five years. They have the latest horror—the H-bomb. Their bombers from existing bases can reach any part of the United States. How many of the super-bombs they have I do not know, but I am certain that the day their stockpile reaches the figure they have decided is enough to crush this country and our allies, the boss man in the Kremlin will blow his whistle and the test will come."

(Continued on following page)

Wing Auxiliary's outgoing president, Mrs. Hazel Riley, presents award to veteran Douglas Aircraft employee, Mrs. Christiana I. St. Clair.

Committee chairmen included, from left, James Czach, Irwin McElliott, Joseph Myers, William Walker, Max Vetensky, James McDivitt, and John O'Loughlin.

Symposium panel members included, seated, Charles Horne, Hall Hibbard, Edgar Schmued, and Arthur Raymond. Standing, Dr. Heinz Haber, AFA's James Czach, S. K. Hoffman.

CONTINUOUS TUNING

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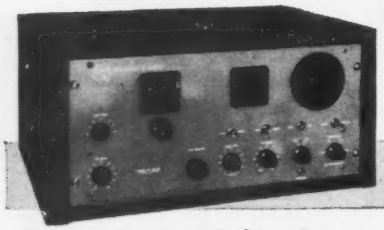

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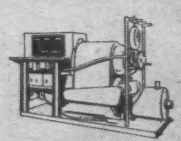

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CALIFORNIA WING—CONTINUED

"Too much of our bomber force is already obsolete or obsolescent," Kenney went on. "We haven't enough modern fighters to guard our overseas bases and protect the homeland. This force will cost money, but not as much as the explosion of just one modern bomb on one of our large cities. We need a knockout punch in our strategic bomber force—now, not some years in the future. We need a far better air defense than we now have."

"With such an Air Force," Kenney declared, "we cannot lose a war; without it we cannot win a war."

Besides President Kenney, those at the three-day California Wing Convention heard a number of other speakers, including the "Future of Flight" Symposium panel, who took a searching look at aviation's next fifty years (see page 70). Earlier, the Wing had honored aviation pioneers in a "Salute to the Past." Among those receiving Citations from retiring Wing Commander Mike Pisani were Jimmy Mattern, who made a round-the-world, solo flight in 1933; veteran movie director William Wellman; Art Goebel, who made the first flight from California to Hawaii; Miss Ruth Elder, transatlantic flyer; Benny Howard, Douglas test pilot; Reginald Denny, movie actor and WW I flyer; and Henry Ogden, a Douglas pilot during the 1924 world flight.

Registered delegates totaled 243, but more than 400 attended the Airpower Banquet at the Del Mar Club to hear President Kenney's speech. The Wing Awards were presented at that luncheon meeting by Pisani and Regional Vice President James McDivitt. The California Wing's top award went to Gen. Curtis E. LeMay and the Strategic Air Command. It was accepted by Maj. Gen. Walter C. Sweeney, commander of SAC's 15th Air Force. The Wing Auxiliary got in the act, too. President Hazel B. Riley presented awards to Miss Jacqueline Cochran, well known aviatrix, and to Mrs. Christiana St. Clair, veteran employee of Douglas Aircraft, who had sewn fabric for such famous aircraft as the World Cruisers and the B-19.

New Wing officers elected at the Convention included Cecil C. Howard, past Pasadena Squadron Commander, as Wing Commander; Merrill Levy, Secretary; Robert Kirby, Treasurer; and Robert Dobbins, Sergeant-at-Arms. Mrs. Dorothy Myers was elected new Wing Auxiliary President. She's the wife of Joseph D. Myers, "right-hand man" of Convention Chairman William W. Walker, whose over-all direction and hard-working committee chairmen contributed mightily to the success of the Convention.—END

At a reception before the Airpower Banquet, Toastmaster Joe E. Brown (at left), actress Terry Moore, AFA President and keynoter Kenney, and Convention Chairman William Walker examine a model of a Douglas C-124.

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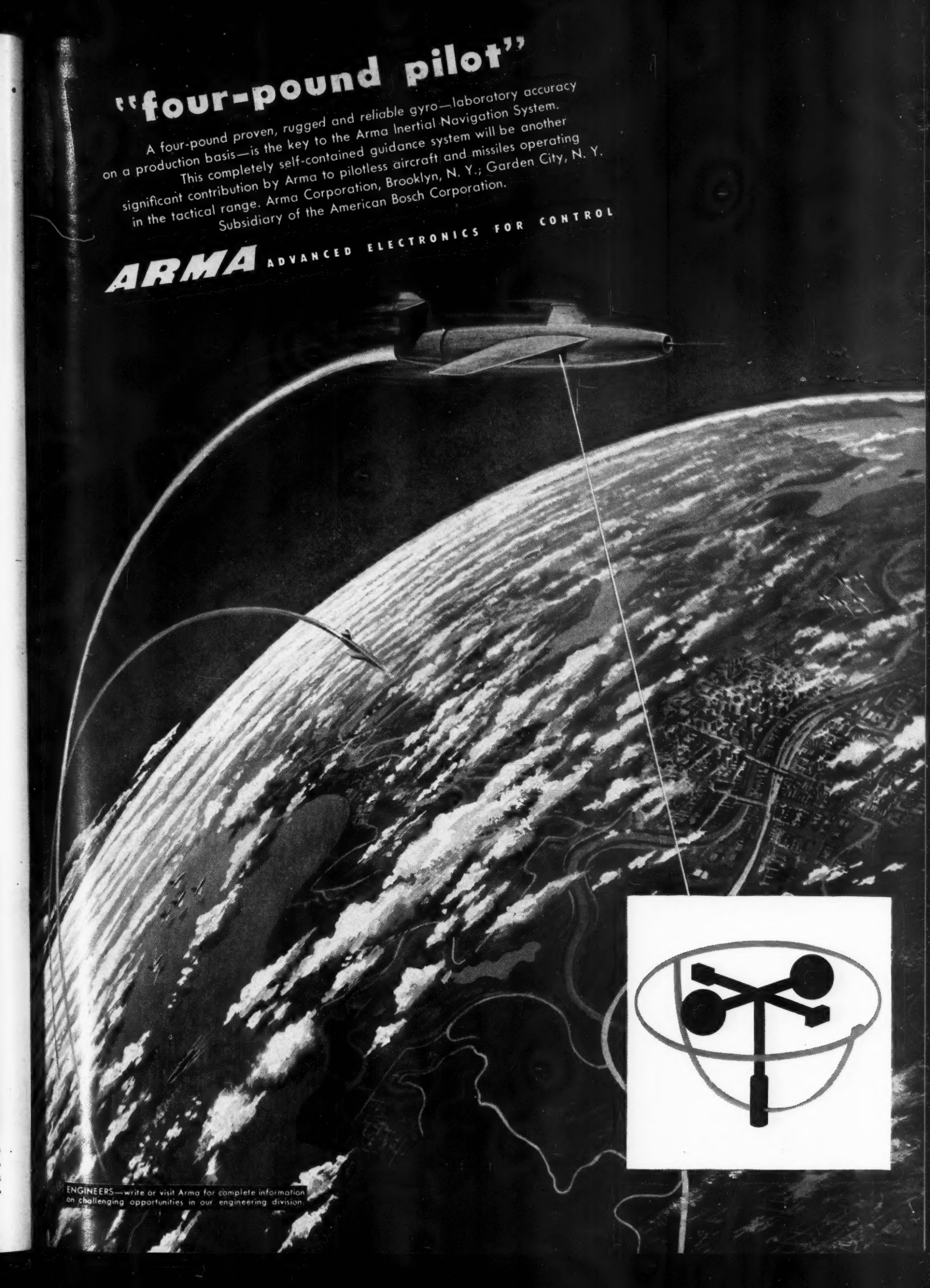

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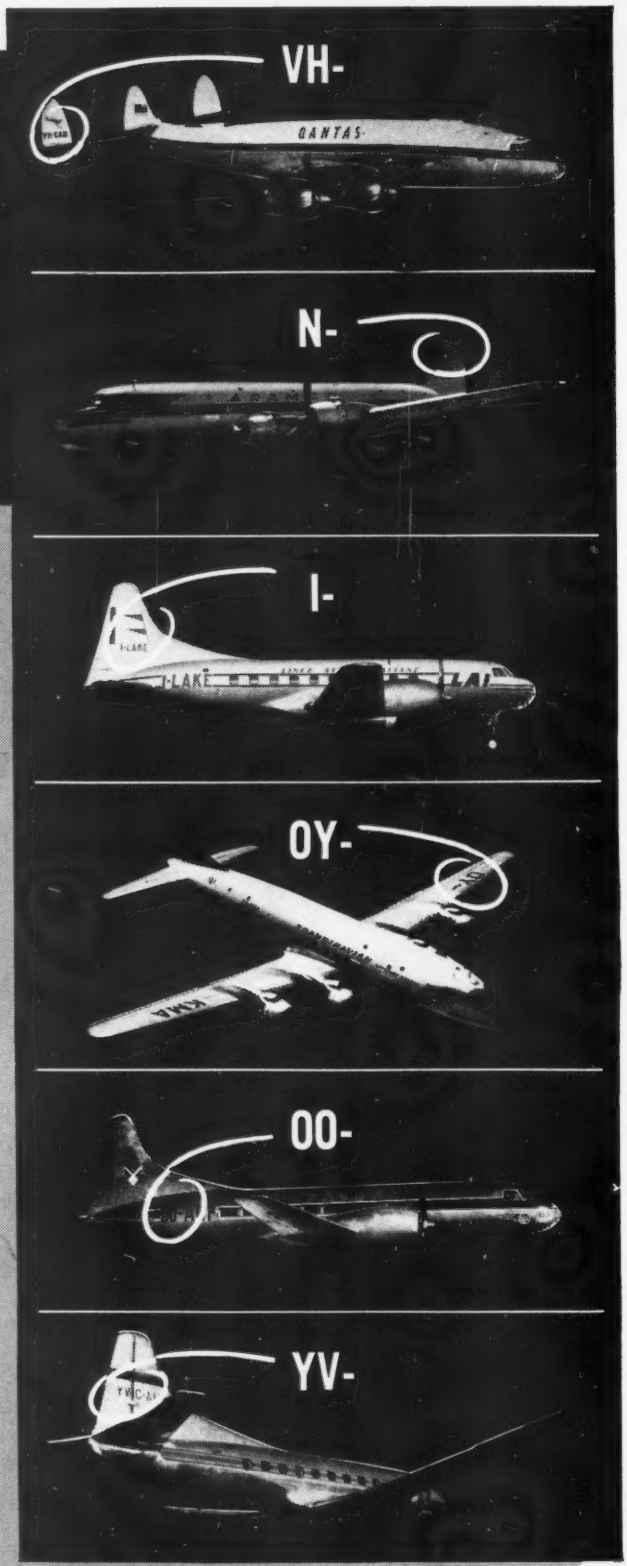

AIRCRAFT NATIONALITY MARKS

Afghanistan	YA
*Argentina	LV
*Australia	VH
Austria	OE
*Belgium	OO
* Belgian Congo	OO
*Bolivia	CP
*Brazil	PP, PT
*Burma	XY, XZ
*Canada	CF
*Ceylon	CY
*Chile	CC
*China (Taipeh Taiwan)	XT
*Colombia	HK
*Cuba	CU
Czechoslovakia	OK
*Denmark	OY
*Dominican Republic	HI
*Ecuador	HC
Egypt	SU
El Salvador	YS
*Ethiopia	ET
*Finland	OH
*France	F
*Greece	SX
Guatemala	TG
Haiti	HH
*Iceland	TF
*India	VT
*Indonesia	PK
Iran	EP
Iraq	YI
Ireland	EI, EJ
*Israel	4X
*Italy	I
*Japan	JA
Jordan	TJ
Lebanon	OD
Liberia	EL
Luxembourg	LX
*Mexico	XA, XB, XC
*Netherlands	PH
* Netherlands Antilles	PJ
* Netherlands Surinam	PZ
* Netherlands New Guinea	JZ
*New Zealand	ZK, ZL, ZM
*Nicaragua	AN
*Norway	LN
*Pakistan	AP
Panama	HP
*Paraguay	ZP
*Peru	OB
*Philippine Republic	PI
Poland	SP
*Portugal	CS, CR
*Saudi Arabia	HZ
*Spain	EC
*Sweden	SE
*Switzerland	HB
Syria	YK
*Thailand	HS
*Turkey	TC
*Union of South Africa	ZS, ZT, ZU
*United Kingdom	G
Colonies and Protectorates	VP, VQ, VR
*United States	N
*Uruguay	CX
*Venezuela	YV

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WHIRLWIND THROUGH NEW JERSEY

General Kenney's one-day tour of New Jersey air facilities is highlighted by a policy conference with Governor Meyner

A state house conference on **aviation policy** with New Jersey's Governor, Robert B. Meyner, highlighted a recent whirlwind tour of the Garden State by Air Force Association's **President George C. Kenney,** arranged by Irving B. Zeichner, former AFA Director.

On his arrival in **Newark,** President Kenney was greeted by Mayor Leo P. Carlin before making a half-hour telecast and receiving the press. Then he visited the Air Age exhibit at Newark Airport and attended a luncheon given by **Roy T. Hurley,** President and Chairman of the Board of the Curtiss-Wright Corporation.

Later President Kenney's party was escorted about the plant of the Stroukoff Aviation Company at **West Trenton** by Maj. Gen. George C. MacDonald.

The group that accompanied President Kenney included Zeichner, New Jersey Wing Commander John Currie, and Brig. Gen. Chester A. Charles, Commander of the New Jersey Air National Guard.

California's **Long Beach Squadron #1's** collection of more than 100 model planes earned the unit a **Citation of Honor** at the recent AFA California Wing Convention. The models, everything from the Wright Brothers' first machine to the newest experimental rocket, were obtained from manufacturers whenever possible. But Squadron members had to construct many others themselves.

The Squadron also built display tables, covered them with blue and gold cloth, and printed cards identifying each plane (see cut). The whole display fits into a special packing case for shipment to other parts of the country and has already traveled safely to New Jersey and back. James Regan is Squadron Commander.

AFA's first airborne presentation of a charter took place April 17 in a DC-3 above Detroit when Detroit Squadron members gave the document to the **Air Explorer Scout** Squadron the AFA unit sponsors. The DC-3 (see cut) belonged to National Automotive Fibres, Inc.

(Continued on page 83)

SQUADRON OF THE MONTH

Long Beach Squadron #1
Long Beach, Calif.

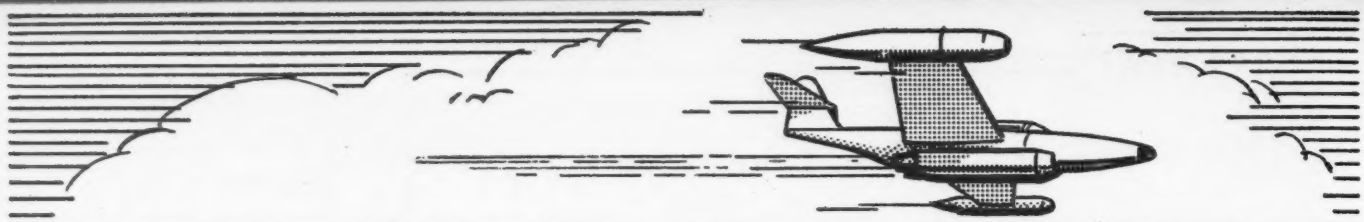
CITED FOR

achievement in the field of airpower promotion. The widespread attention attracted by the Squadron's model aircraft display has materially furthered the aims of the Air Force Association.

At Ute Squadron Charter presentation are, seated from left, Paul Fisher, Wing Commander; Sqdn. Cmdr. George H. Van Leeuwen; and Vice Cmdr. Con Hartley. Behind them are Paul Tollestrup, Treasurer; and Fred Hannah, Sec'y.

Before take-off for aerial charter presentation are members of Air Explorer Squadron 87 and representatives of Detroit Squadron, who sponsor the group.

Here's part of the Long Beach Squadron's display of model aircraft.



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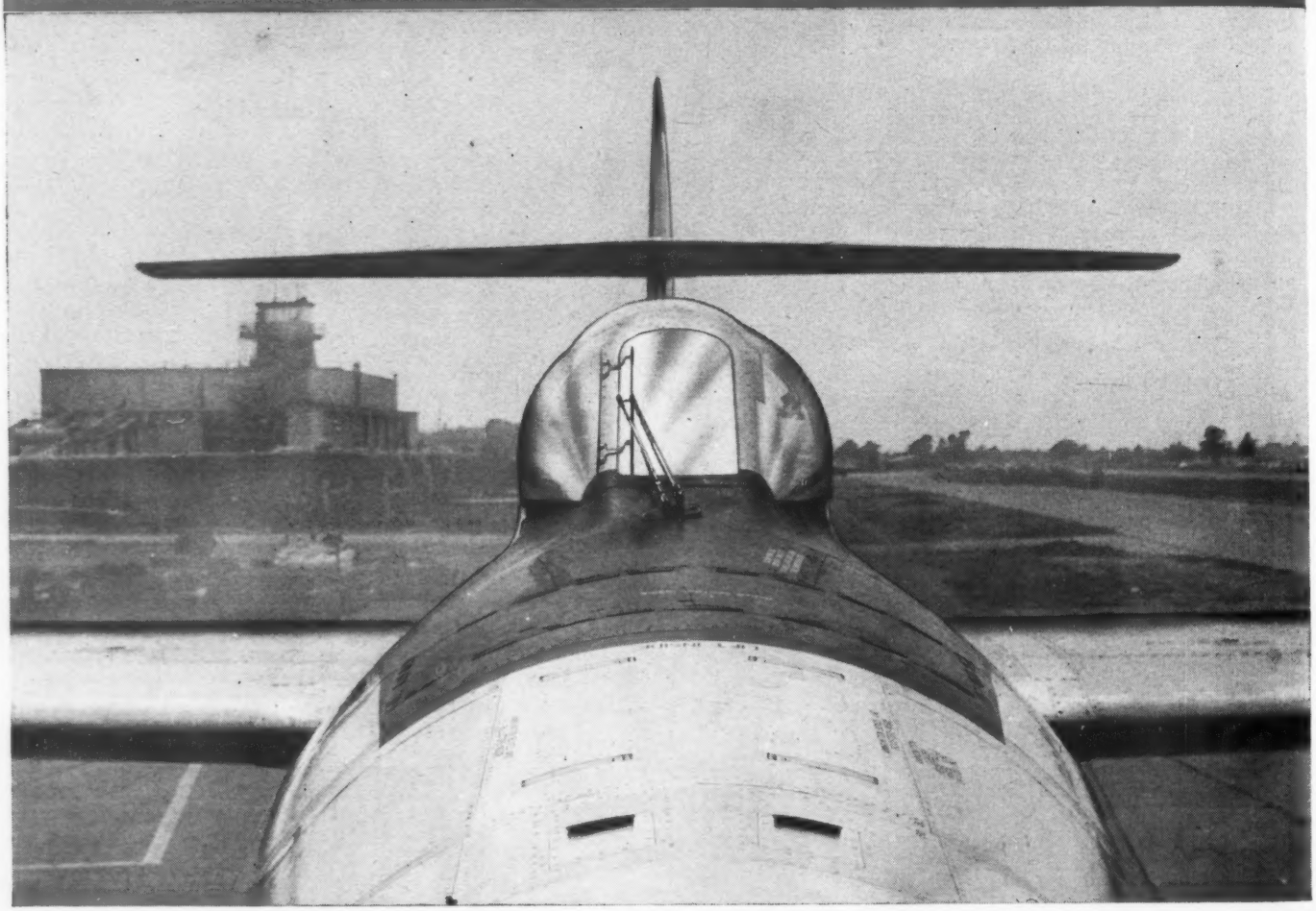

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AFA Regional V-P James H. McDivitt, right, presents California Wing Citation of Merit plaque to Kata Ragoso, president of Western Solomon Islands Mission of the 7th Day Adventists, for his rescue work during World War II. Ragoso led a group of natives who saved more than 200 Allied soldiers, including AF members, from behind enemy lines in the Solomons. Ragoso was in California to attend a religious conference.

Credit for organizing and planning the Air Explorer unit goes to Charles Cheriez, an Associate Member of the Squadron.

One of AFA's **four new Squadrons** is in **Daytona Beach, Fla.** Officers are Charles G. Albrecht, P.O. Box 525, Commander; Columbus P. Ward, Vice Commander; and George M. James, Secretary-Treasurer. Councilmen include James Spencer, Jack Dunlop, Cecil McClanahan, and Fred Thranhardt.

The **Lone Star Squadron,** of the Dallas-Fort Worth area, was charted on April 27, becoming the second active Squadron in Texas. The Commander is Joseph M. Averill, 4827 Gaston Ave., Dallas. Other officers are John H. Johnson, Vice Commander; Billy M. Claunch, Secretary; and D. H. McAnally, Treasurer. Councilmen are Jerry Davidson, Joseph Dashiell, Leonard Raines, and C. G. Brock.

A new Chicago area Squadron is the **Ken Fogel Loop Squadron,** whose Commander is Harold G. Carson, 9541 So. Lawton, Oak Lawn, Ill. Other Officers include William C. Lent, Vice Commander; James S. O'Connor, Secretary; and Ted Jendrzejewski, Treasurer. Councilmen are J. Lafeton Whitney, Howard Markey, John Schroeder, George Scott, Wilfred Burdick, and Robert Besancon. The Charter will be presented at the Illinois Wing Convention in Chicago on June 6.

Another Squadron, **Springfield,** has been added to the Missouri Wing. Carl Benning, 523 Woodruff Building, Springfield, is the Commander. Other officers are Neal Grubaugh, Vice Commander; Robert Earnest, Treasurer; and Marlys Haik, Secretary. William Peck, Claude Walsworth, Wanda Nightingale, James Slattery, and Milo Salyer are Councilmen.

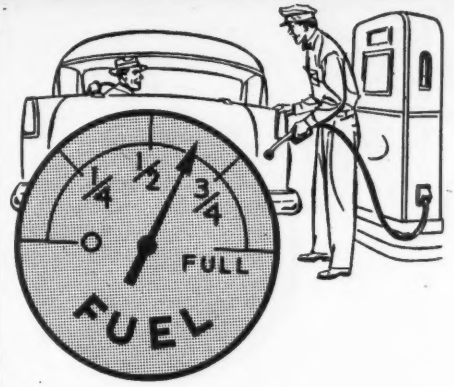
Two **new Auxiliary units,** both in California, join AFA's ranks this month. One, the **First Reserve Unit,** in Long Beach, elected as its President Mrs. Peggy Gunnafson, 6012 Elkport, Lakewood. Other officers are Mrs. Vida Hunter, Vice President; Mrs. Ruth Powell, Secretary; and Mrs. Mildred Damman, Treasurer.

Stanislaus Squadron also chartered its Auxiliary Unit, and the President is Mrs. Elizabeth Hanson, 525 Reno Ave., Modesto. She is the wife of the Squadron's first Commander, Zenas Hanson.

The **Tampa, Fla., Squadron** held another in its series of **dinner meetings**

(Continued on page 85)

John Warner, left, AFA Maryland Wing Commander, discusses talks he will make to 2286th AFR STC with CO Col. Bullen, right, and Lt. Col. J. A. Gibbs.



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• **An analog computer** is a continuously calculating machine whose answers can be continuously changing and quantities are represented without explicit use of numerical symbols. It operates on the similarity of various quantities. For example, to measure the level of gasoline in an automobile tank, we normally use a float which rises and falls with the surface of the liquid. By measuring the height of the float we learn the quantity of the gasoline in the tank. It would be clumsy to transmit this indication to the front seat with levers and pulleys. But if we let the float position regulate a flow of electricity, then the electrical analog of the float's position can be read on a voltmeter in the dashboard. Thus your fuel gage is a simple analog computer.

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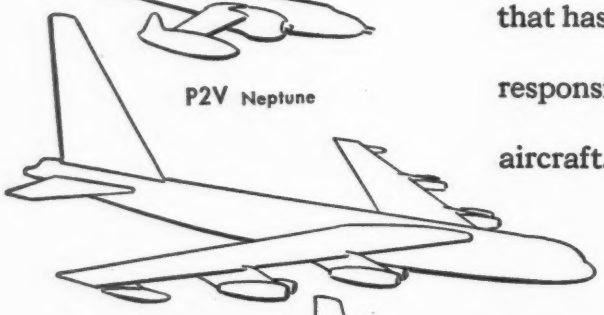
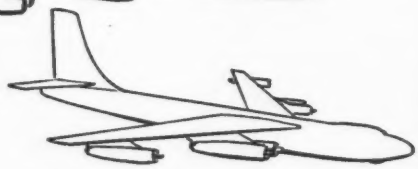


B-52 Stratofortress



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last month, with an attendance of 221 at the nearby McDill AFB Officers Club reported by Thomas Dawson, Squadron Commander. The principal speaker was AFA Director Carl A. Spaatz.

The guest list included Brig. Gen. H. K. Mooney, 6th Air Division Commander; Brig. Gen. Jack Beam, USAF, Ret.; Tampa's Mayor Curtis Hixon; J. C. Council, publisher of the *Tampa Morning Tribune*; Hampton Dunn, managing editor of the *Tampa Daily Times*; and Beirne Lay, Jr., author and screen writer of the Paramount film "Strategic Air Command," now in production. Jerome A. Waterman, Southeast Regional Vice President, was toastmaster.

Earlier, General Spaatz, General Mooney, Waterman, Dawson, and Squadron Secretary Bill Byron had taken part in a program at Hillsborough High School.

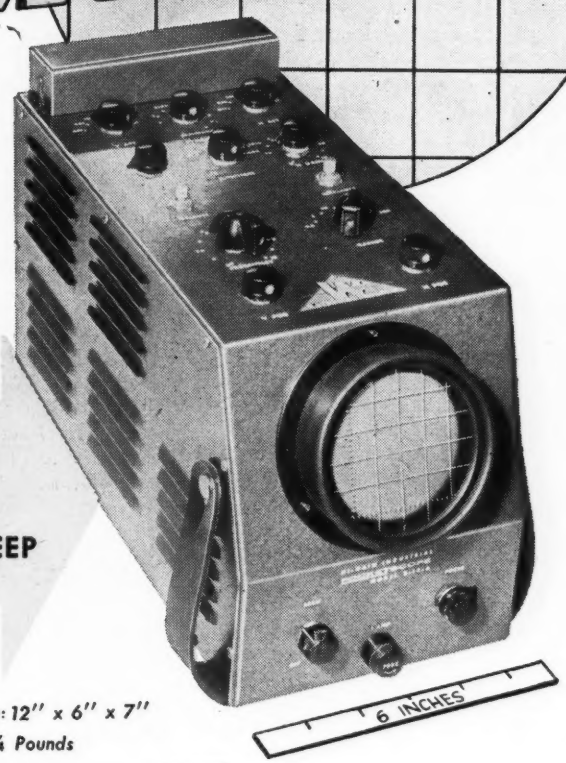
Chicago's Squadron 41, the first unit to plan and stage **airpower symposiums** at the local level, has held the fourth in its current series, aimed at educating the community on the problems American airpower faces.

The principal speaker was William Crummer, in charge of public information for Chicago's Civil Defense Corps. Describing the city's present state of readiness, he warned that if an H-bomb were dropped on the Loop, the best suggestion he could give Chicago citizens would be to "stay where you are." Our best defense, he said, is the great retaliatory power of the USAF.

Other speakers on the forum panel included Lt. Col. John Gaffney of the 42d Fighter-Interceptor Squadron based at O'Hare Airport; and Lt. William Lawter, PIO, Chicago Filter Center.

CROSS COUNTRY . . . Roger Reading, a member of the Los Angeles Squadron, won both first and second prizes (an all-expense trip for two to Las Vegas, Nev., and a Leica camera and projector) in the California Wing raffle. Some 3,300 stubs were in the barrel. Vince Barnet pulled out the winning tickets . . . The **New Orleans Squadron** is sponsoring a summer-long fishing derby, open to all members of the Armed Forces in the area . . . **Robert Leitner,** of the Elgin, Ill., Flight, was chairman of a program that obtained AFA Director **John P. Henebry** as principal speaker for the local Junior Chamber of Commerce. More than 100 people heard Jock speak on air transport . . . In addition to the main speaker, AFA President George C. Kenney, the Illinois Wing Convention will also have as a guest **Maj. Gen. Glenn O. Barcus,** Deputy Commander of the Air Training Command, better known for his service as Fifth Air Force Commander during Korea . . . **Baltimore Squadron**—AFA's first chartered Squaddon—now boasts a permanent meeting place in the Emerson Hotel, Baltimore. Squadron meets at 8 P.M. the second Monday of each month.—END

HIGH GAIN INDUSTRIAL
POCKETSCOPE
by Waterman



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Contract Schools

Making Pilots Is Their Business

Private enterprise takes over all the AF's primary flight training. It's a move that's paying dividends now and would pay more in an all-out emergency

By Ed Titus

His thoughts aloft, an aviation cadet at Marana Air Base, Ariz., where one of the contract schools is, checks his engine before take-off time.

HOW FAR should the Air Force go in contracting with civilians for various services?

This question comes up with particular emphasis these days for two reasons:

1. Our whole defense program is under critical examination to determine how we can get the most defense for the least money.

2. There is an acute need to conserve Air Force manpower, particularly flying manpower, for strictly military duties. In fact, recent drops in enlistment and reenlistment have cut the numerical strength and experience level of the Air Force, and new measures may be required to achieve the goal of 137 wings.

Civilian contracting policies have a direct bearing on both money expenditure and manpower problems. And I had an opportunity this spring to observe the working out of these policies when a group of writers visited three of the nine USAF contract flying schools. Our trip was sponsored by Lt. Gen. Robert W. Harper, Commander of the Air Training Command, and Maj. Gen. Gabriel P. Disosway, Commander of the Flying Training Air Force.

Now that Goodfellow AFB in Texas is closing its primary activities, these nine, run as private business enterprises under AF supervision, are handling all primary flight training for the Air Force.

The results the contract schools are getting appear to confirm the conclusions of an exhaustive study by Stanford Research Institute, which indicated contract primary flight operation would afford economies of manpower and money.

How many dollars the schools are saving is difficult to calculate. One estimate, from an Air Force source, is $1 million per school per year, or a $9 million economy from the nine schools.

The Air Force pays the primary school contractor around $35 an hour flying time as operational cost of performing services required under his contract. The services include flight and ground school instruction, aircraft maintenance, base operation, police and fire protection, servicing mess and housing facilities, and some smaller incidental jobs like manning the control tower. Contract costs vary somewhat, depending upon location, size of base, type of building construction, local labor market and other factors. The contract price includes a fee of $1.10 per hour for the contractor. This is not as lush a deal as it may appear because there are non-reimbursable items such as interest that must come out of the $1.10. Since the start of the program, an operator may have needed bank loans averaging $500,000 against reimbursements for bills already paid by him.

Some I talked with believed the contractors could do the job for even less if they were taken off the cost-plus-fixed-fee basis, and were paid an inclusive amount per flying hour—enough to cover all costs and allow a reasonable profit. They would handle the entire primary training program just as at present, and would be supervised by the military in the same way, and held to the same standards. Under such a setup, they would have to move even farther in the direction of a private industrial operation, and be relieved of certain paper work, technical orders, and procedures that are now required under their contracts.

From the service standpoint, the cost-plus-fixed-fee contract appears to be more advantageous, because it permits changing programs on short notice. And it avoids limitations inherent in having to specify exact requirements for a year ahead.

On the manpower side, it is pointed out that even if the private contractors required the same number of men the military would need, the contract system might have advantages, since the military men would be released for military duties. However, when the contractors can do the job with fewer men, the advantage is even greater.

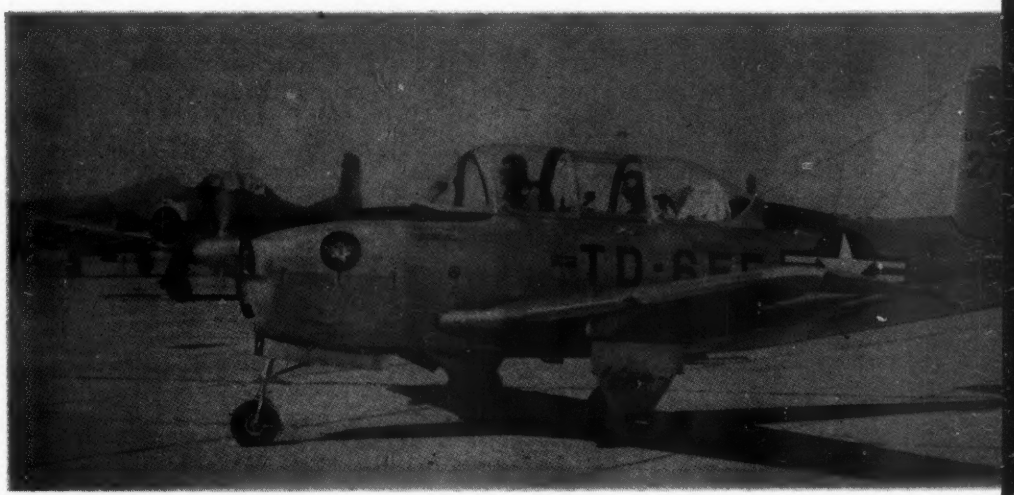
Several factors contribute to efficient contract operation.

The contractors have fewer time-consuming encumbrances from military procedure. They can hire and fire whom they please, thus avoiding square pegs in round holes.

They can select seasoned flight instructors, who want to work at the bases where they are hired and who may wish to make a career of flight training.

The schools can take their pick of maintenance personnel, sometimes getting men like Claud Hollis, who heads the maintenance shop at Hondo AFB near San Antonio, and has been doing this kind of work since 1919.

And take the mess and KP agony. Here is a real story. The contractor employs a steward of his own choosing. Held to quality standards, he buys the meat and produce he wants, in quantities that assure prompt use to avoid spoilage. He hires the help he needs, fires those he doesn't need or doesn't want. The kitchen job appears to be done better, at less expense, and with far less waste of manpower, than by the time-honored service-cook and KP procedure.



The new Beech T-34 is replacing the Piper Cub this month at Marana AB, Ariz.

ATRC is so much interested in the contract method for mess that it has scheduled a large-scale trial run at Vance AFB, in Oklahoma. It plans to contract the mess out directly to some private operator experienced in mass feeding for industry. Some 2,500 enlisted men will be fed in this experiment.

If this contract idea spreads, the hallelujahs of the ex-KPs will be deafening. And the manpower released for more skilled tasks will be immense.

The ATRC also is trying out contract fueling, with the Air Force supplying fuel and facilities, and the contractors' employees doing the actual work. USAF has been using contract overhaul and modification of aircraft quite extensively for some years now. And contract maintenance of surface vehicles is being considered.

The three schools we visited were

(Continued on following page)

those run by Texas Aviation Industries at Hondo AFB, near San Antonio; Darr Aero Tech, at Marana AFB, near Tucson, Arizona; and Anderson Air Activities at Malden AFB in Southeast Missouri. The other contract schools are at Bainbridge and Moultrie, Georgia; Bartow and Marianna, Florida; Kinston, North Carolina; and Columbus, Mississippi.

Hondo, at the time of our visit, was manned by approximately 700 civilian employees of the contractor, nineteen Air Force officers, and thirteen enlisted men. There were about 415 cadets and student officers, including young men from Mutual Defense Assistance Pact countries, in training. (Normally there are 500.)

The military detachment is charged with quality control. Commanded by a military supervisor, a lieutenant colonel, they coordinate military training, student needs, and Air Force regulations with the contractor. The military are also responsible for discipline except on the flight line.

The government supplies materiel, including aircraft. The Auditor General's office and the Southern Air Procurement District have representatives at the base to watch the Air Force dollar.

Texas Aviation cites these efficiencies and economies of the contract system:

- Civilians are nct granted three-day passes or thirty-day leaves; only seven days sick leave and ten days vacation are granted annually. A forty-hour week is worked by every employee.
- Civilians begin working the day they are hired, because of previous training.
- Civilians can be fired for inefficiency without court martial or transfer red tape.
- Civilian employees are more stable, because they are in their chosen fields, and not subject to transfer.
- At contract schools, the local dispensary serves trainees and the small military party only. Under full military operation, a larger hospital complement would be required for aircraft mechanics, instructors, etc., and their families—perhaps some 2,000 additional people. Housing and recreation facilities and personnel to operate them also would be needed for the 2,000.

John Cape, Executive Vice President of Texas Aviation, estimates costs at Hondo have been cut $56,000 a month since July 1953, principally through reducing the number of employees. The schools, through their association, the Aeronautical Training Society, headed by E. Merritt Anderson of Anderson Air Activities, can compare methods and exchange information leading to more efficient use of manpower.

Hondo is proud of its utilization and maintenance record, and reports an average of ninety-eight percent of the T-6s and ninety-nine percent of the Piper Cubs in commission.

Morale efforts at Hondo appear to have succeeded. It centers around trying to make the flight instructor a sort of second father to each of his four trainees. (The average flight instructor at Hondo is thirty-two, has had previous military flying experience, and has 4,300 flying hours to his credit.)

"Jimmy Doolittle gave me my first ride," says John Cape, vice president of the contracting firm, "and I'll never forget it. And even if we gave every boy here a mansion to live in, the man in the back seat would still have more influence on him than any material comfort."

At Hondo they do everything—short of mollycoddling—to make a cadet into a pilot. If he develops a flying deficiency, they look for possible psychological causes. It may be trouble with his girl friend. If they find that out, they can judge better whether he will eventually snap out of it.

One boy had flown 107 hours and suddenly asked to quit. Why? They found he feared acrobatics. Knowing his fear, they concentrated on eliminating it, and later he became an acrobatic enthusiast.

Back in 1952, eleven boys wanted to quit after seeing their families and sweethearts over the Christmas holidays. Last Christmas only one wanted to, and this was a hardship case.

This evidence of improved morale is important at a time when manpower turnover in the Air Force is a matter of concern.

Marana AFB, the second contract school we visited, is thirty-two miles north of Tucson. The climate is dry and sunny, and Marana hadn't missed a scheduled flying day since January 18, 1952.

Darr Aero Tech, which operates the school, is headed by Hal Darr who operated a group of World War II contract flight schools. It has Maj. Gen. Charles W. Lawrence, USAF ret., with thirty years in the Air Force and seventeen years of it in air training, as director of training. Lewis E. Boxleiter, in aviation twenty-five years, is director of flying.

This month Marana will be the first base to introduce new planes for primary training. Currently, each primary trainee gets twenty hours in a Piper Cub and 120 hours in a T-6, both with conventional landing gear.

The Beech T-34 will replace the Cub. It has tricycle landing gear, constant speed propellers, and cockpit and instrument configuration similar to combat aircraft. Students will get forty hours in the T-34. And the venerable T-6 will step aside for the North American T-28 for the second phase of primary training, totaling ninety hours.

Our next stop was at Malden AFB in Missouri. There we lived in cadets' quarters and had a glimpse of how their military training goes on simultaneously with schooling in flight.

We were awakened by traditional reveille, by shouts of "Six minutes to first call!" and the familiar "hut, two, three, four."

Two dance orchestras kept things rolling Friday evening. Cadets and student officers, including a large sprinkling of trainees from France, Venezuela, and other friendly countries, danced in the Cadet Club, with girls rounded up from the countryside and Southeast Missouri State College. Meanwhile the married officers and civilians relaxed at the Consolidated Club.

The next evening, we completed our Washington-to-Washington circuit of 4,340 miles.

The trip could not but bring about a realization of what civilian contracting can offer for our permanent preparedness picture. It seems in the cards that contracting not only will be continued but also will be extended.

The early struggles of those who backed the contract school idea contrast with the firmly established character of the schools today. Recently some of the old-timers who threw their lot in with Gen. Hap Arnold in 1939, when the contract schools were first started, recalled that one mildly timorous soul questioned Arnold about what would happen if the project failed.

"If it doesn't go over," he said, "I'll be worse off than Billy Mitchell, but so long as I'm here, we are going to do what needs to be done."

It was a little group of World War I pilots and few others who gambled their bottom dollars in 1939, to answer Hap Arnold's call.

Some had been old friends of Hap's, and one, Maj. C. C. Moseley, a great pursuit pilot, had been his aide in France in World War I. Also answering his call were former combat pilots including W. F. Long, Dallas; H. S. Darr, Chicago; Maxwell W. Balfour, Tulsa; Oliver L. Parks,

(Continued on page 91)

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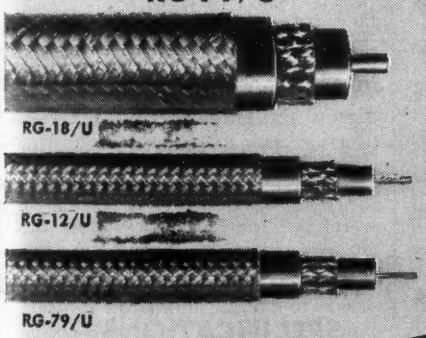

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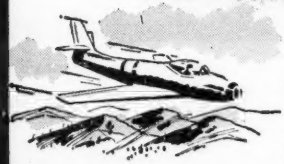

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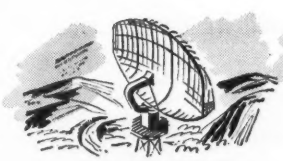

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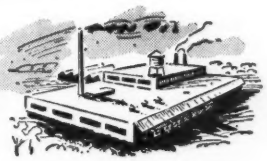

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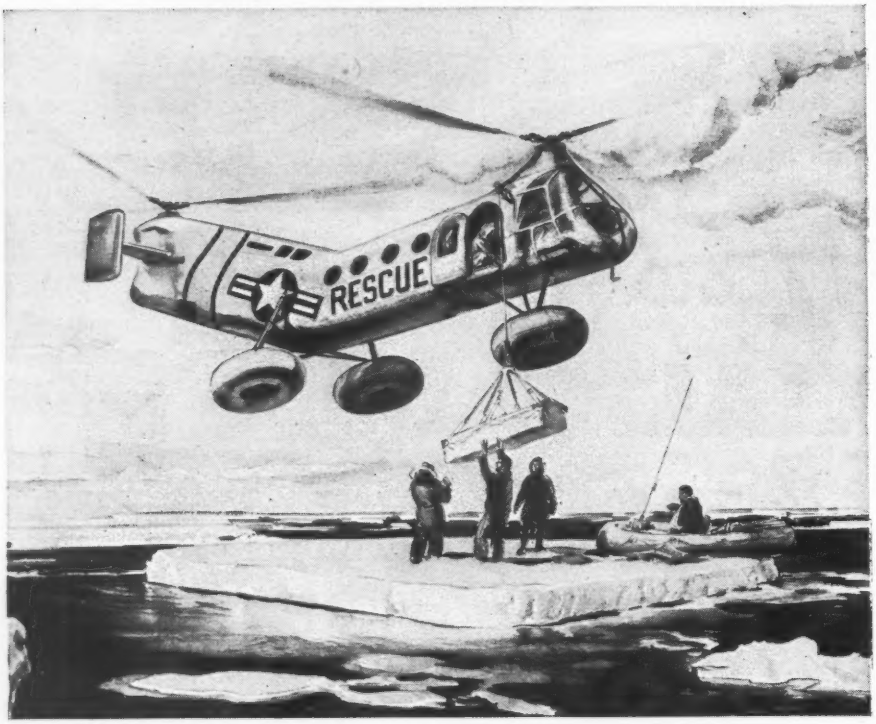

Drawing courtesy of Piasecki Helicopter Corporation, Morton, Pennsylvania

THE H-21 Piasecki Tandem Helicopter—the "Work Horse"—is ideally suited for rescue work in areas inaccessible by other means, and in all kinds of rough weather.

For durable paint adhesion and high corrosion-resistance aluminum parts of the "Work Horse" are Alodized. The "Alodine" protective coating chemical bonds paint, extends paint life, and protects unpainted aluminum.

Because of its economy, effectiveness, and ease of application, the Alodizing process is finding wide-spread use in the aircraft field and in other industries fabricating products of aluminum.

Alodized aluminum meets the requirements of Military Specification MIL-C-5541. Write or call for coating and process data on "Alodine."

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"Alodine" forms an amorphous non-metallic surface on aluminum which is thin, tough, durable, continuous with and a part of the basis metal. The "Alodine" film (or skin) anchors paint, prolongs paint life, and protects aluminum exposed unpainted to the atmosphere.

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1. Cleaning the work.
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3. Coating with "Alodine."
4. Rinsing with clean water.
5. Rinsing with warm "Deoxylyte" (acidulated rinse).
6. Drying.

AFTER TREATMENTS: Alodized aluminum provides an ideal bonding surface for paint, wax, adhesive, or other organic finishes. These should be applied in accordance with the manufacturer's directions. Unpainted or exposed areas will be protected by the tough, durable "Alodine" skin.

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AN-E-19	AN-C-170 (See MIL-C-5541)
AN-F-20	U.S.A. 72-53 (See AN-F-20)

CONTRACT——CONTINUED

East St. Louis; and Claude Ryan, San Diego. Two non-military fliers, Allan Hancock and E. S. Sias, reported with the rest.

All had to finance themselves and be ready in six weeks. They started without a contract, memorandum or letter of intent. The arrangement was so indefinite no banker would touch the deal. When the matter of authority came up later, it was passed by Congress by just two votes. But training was started July 1, 1939. During the next six years, the schools taught some 250,000 young Americans to fly, operating under Air Force programs.

After World War II the contract schools were abandoned, and the contracts terminated.

Five years later came Korea. Once again, the SOS went out to the civilian school operators, including some of the same crew which had staked everything on General Arnold in 1939.

Some bases, like Malden in Missouri—where most of the buildings had been left standing—were reconstructed at comparatively small cost. Malden was rebuilt by Anderson Air Activities for $668,000.

The job at Marana in Arizona was more extensive. There, in 1945 and 1946, usable surplus equipment had been transferred, buildings salvaged and given to schools or sold to the public. Nothing remained but the runways, ramps, a few old buildings, and the quiet desert.

When the new emergency hit, Hal S. Darr and Frank D. Beiser hustled to Marana on August 1, 1951, armed with a letter of intent, with sixty days to get the base rolling. The first class of cadets arrived and were housed and fed on schedule. Ninety-seven days after reconstruction was started, the first official training flight cleared from base operations.

Next time we won't have ninety-seven days. We'll be lucky if we have ninety-seven minutes. However, with the civilian contract schools in continuing, permanent operation, an enlarged training program can start almost immediately. Distributed over the country, the school program adheres to the principle of dispersion as a protection in case of attack. Moreover, they are keeping a large group of civilians—including many flyers and skilled ground personnel retired by the armed services—active and ready to take over bigger tasks in an emergency.

We were lucky in 1939 to 1945 and again in 1951. But we can't trust to luck again.—END

MESSAGE TO AN ENGINEER THINKING ABOUT THE FUTURE— HIS FUTURE

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• To assist in obtaining and maintaining adequate airpower for national security and world peace. • To keep AFA members and the public abreast of developments in the field of aviation. • To preserve and foster the spirit of fellowship among former and present members of the United States Air Force.

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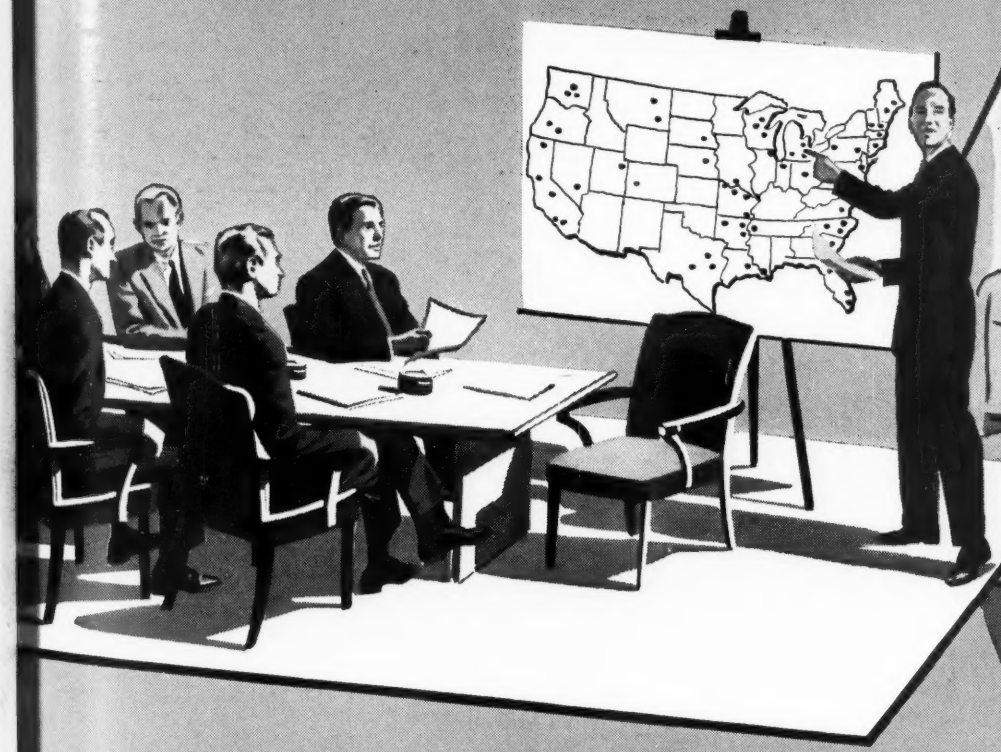

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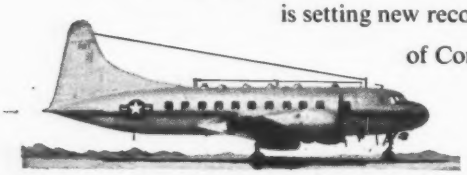

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